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MAY'S

DISEASES OF WOMEN,

BEING A

CONCISE AND SYSTEMATIC EXPOSITION OF THE THEORY AND PRACTICE OF GYNECOLOGY.

FOR THE USE OF STUDENTS AND PRACTITIONERS.

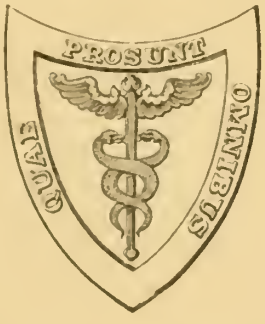
SECOND EDITION,

REVISED BY

LEONARD S. RAU, M.D.,

ATTENDING GYNECOLOGIST TO HARLEM HOSPITAL, OUT-DOOR DEPARTMENT, NEW YORK;
ATTENDING PHYSICIAN TO THE OUT-DOOR DEPARTMENT,
BELLEVUE HOSPITAL, NEW YORK.

WITH THIRTY-ONE ILLUSTRATIONS ON WOOD.



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PREFACE TO SECOND EDITION.

In preparing this second edition, the original scope of the work has been kept in view, so that the revision has not materially increased the size of the book, but has aimed rather to improve upon the contents of the first edition where this was found possible.

Chapters I. and VIII. have been, for the most part, rewritten.

It has been considered advisable to insert a moderate number of illustrations, where these were necessary to elucidate the text. In the preparation of this edition the reviser has had occasion to consult, besides the works enumerated in the preface to the first edition, the writings of Winckel and the lectures of Prof. W. T. Lusk, Bellevue Hospital Medical College, N. Y., the pages of *The American System of Gynecology* (Lea), the *Reference Handbook of the Medical Sciences* (Wood), and the *Annual of the Universal Medical Sciences* (Davis), and the files of the *Medical Record*, *American Journal of the Medical Sciences*, *Medical News*, and *American Journal of Obstetrics and Diseases of Women and Children* since 1885.

It is hoped that this second edition will continue to occupy the position of an aid to the student and practitioner; and that it will be received with as much favor and favorable criticism as was accorded the previous edition.

LEONARD S. RAU, M.D.

HOFFMAN ARMS,
640 MADISON AVE., NEW YORK,
April 1, 1890.

PREFACE TO FIRST EDITION.

In the following pages, the author has aimed to give, in as concise a manner as possible, an exposition of the theories and practice of the diseases peculiar to women, which shall represent the accepted views in this modern science.

These have been condensed, classified, and arranged so as to make the book a short and systematic treatise; necessarily, therefore, it cannot fill the place of exhaustive works.

The author claims no originality for any of the statements embodied in the volume; it is chiefly a *compilation*, and embraces a careful *résumé* of the writings of Emmet, Thomas, Mundé, Simpson, Barnes, Playfair, Duncan, Hart and Barbour, Hewitt, Tait, Schröder, Fritsch, and the lectures of Profs. J. W. McLane and G. M. Tuttle, at the College of Physicians and Surgeons, New York.

It is intended to aid the student who, after having carefully perused larger works, desires to review the subject; and it may also be useful to the practitioner

who wishes to refresh his memory rapidly, but has not the time to consult larger works.

To these, and for these purposes, it is hoped the volume may prove useful.

New York, October, 1885.

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CHAPTER I.

METHODS AND INSTRUMENTS OF EXAMINATION OF THE FEMALE GENERATIVE ORGANS.

General examination—Local examination, external—Local examination, internal—Positions of patient: Dorsal, left-lateral, genu-pectoral, erect—Methods of examination—Vaginal speculum—Other instruments: Sound, probe, retractor, tenaculum, cervical dilator, curette, tampon, pessary.

In making a gynecological examination, it is important to have a systematic method; in this way nothing will be omitted and many cases will be cleared up and diagnosticated easily and exactly, which otherwise would present many difficulties.

The following methods of examination are those usually employed:

(*a*) **General examination**: Obtain a careful history of patient, including history of parents and relatives, patient's condition during childhood, age at which she first menstruated, the regularity, amount of pain, and quantity of blood lost, etc. The history of abortions, labors, and puerperal conditions is important; the beginning of the present illness and an enumeration of all the symptoms should also form part of this history. In addition, this general inquiry should include a careful physical examination of all the other

organs and also an analysis of the urine. This having been done, we are ready to proceed to the

(*b*) **Local examination—External**: Patient is placed upon a flat table, lying upon her back (corsets having been removed and clothes loosened). The abdomen is then exposed and examined in the following ways:

1. *Inspection*, which shows the form of the abdomen, position of umbilicus, striæ, pigmentation of median line, etc.

2. *Palpation*, revealing the presence of fluid or solid contents. Palpation may be (*a*) simple, both hands being employed and depressing the abdominal walls, which are relaxed by having the woman flex the lower extremities; and (*b*) abdominal palpation *with sound* in uterus.

3. *Percussion*, eliciting dulness, flatness, or tympanitic note.

4. *Auscultation*, giving information of the presence of fœtal heart sounds (if pregnant), uterine bruit (if pregnant or fibroids), gas in intestines, friction murmurs, etc.

5. *Mensuration*, useful in tumors of the ovaries, giving indication of increase or diminution in size.

6. *Succussion*, often giving evidences of fluid contents.

A very useful plan is to mark out with a blue pencil the outlines of the different organs and other points, as found by palpation, percussion, etc.

Then follows the

(*c*) **Local examination—Internal**: This can be conducted in one of the four following *positions:*

1. Dorsal decubitus.

2. Left-lateral or Sims's position.

3. Genu-pectoral (knee-chest).
4. Erect.

1. Dorsal Decubitus.—Patient on her back on flat table with foot-rests, hips elevated and at edge of table, lower limbs flexed, knees separated, feet somewhat approximated (Fig. 1).

Fig. 1.

Dorsal decubitus.

Whilst in this position the patient may be examined:

(*a*) *Per Vagina.*—Stand in front of the patient, inspect the parts and then pass up the index or the index and the middle fingers of either hand (well greased), at the same time depressing the perineum with the other fingers. It is important to practise with either hand, as it is desirable to be ambidextrous. The disengaged hand should be placed on the abdomen.

(*b*) *Vagino-abdominal or Conjoined Manipulation.*—The index finger of one hand being in the vagina, the other hand over the abdomen, bring the uterus between the two hands.

(*c*) *Rectal.*—By passing one or two fingers into the rectum; or (Simon's method) passing in entire hand (rather difficult, dangerous, and seldom necessary).

(*d*) *Recto-abdominal.*—By aiding the fingers of one hand in the rectum by the other hand on the abdomen.

(*e*) *Recto-vaginal.*—By fingers of one hand in rectum and one or more of other hand in the vagina.

(*f*) *Recto-vesical.*—By passing sound into the bladder and directing it toward index-finger in rectum; or, occasionally, by dilating the urethra and using the index-finger instead of the sound.

(*g*) *Recto-uterine.*—A combination of rectal touch with sound in uterus.

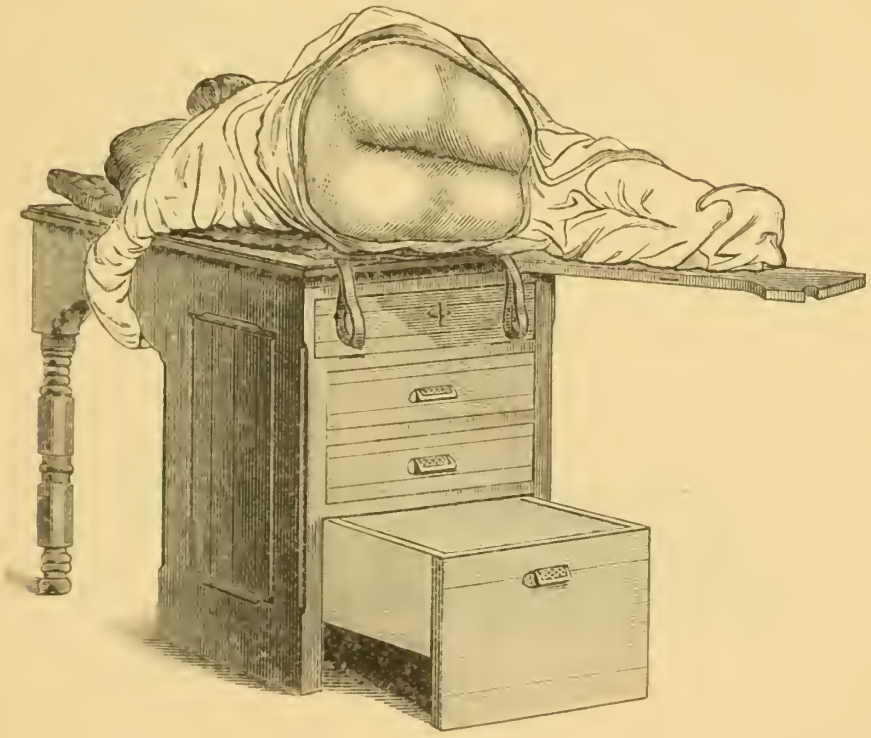
(*h*) *Vesico-vaginal.*—By passing sound into bladder and palpating upon it, with fingers of other hand in the vagina.

When the sound or catheter is passed into the bladder under the bed-clothes, there is risk of introducing vaginal secretion and thus perhaps causing a cystitis. Whilst, therefore, in hospital practice it is better to expose the parts, in private practice this cannot usually be done, on account of the objections of the patient.

2. Left-lateral or Sims's Position.—Very important, the only objection being that an assistant is required to hold the speculum, or else a self-retaining instrument must be made use of, and the latter is usually cumbersome and often unsatisfactory. The woman lies on her left side, obliquely across the table with buttocks near the lower left angle, both limbs

flexed, right somewhat higher than left; then the left arm is withdrawn and flexed across the back, and the woman turned on her breast as much as possible. The head should be lower than the pelvis. (Fig. 2.)

FIG. 2.



Sims's position.

3. GENU-PECTORAL (KNEE-CHEST).—Patient rests upon her knees and chest. It is employed especially for reposition of displaced uterus, for tamponing the vagina, in the diagnosis of cysts of ovary (length of pedicle), and to explore the vesico-vaginal septum.

4. ERECT POSTURE.—Patient stands with legs separated; the physician, kneeling or sitting in front, passes his hand up under clothing and his fingers over the perineum into the vagina. This is useful in determining prolapse of uterus, and also after a pessary has been introduced whilst the patient is on her back, to see if it

remains in place and gives the proper support after she has assumed the upright position.

Vaginal Speculum.—After making a digital examination, we should introduce a *vaginal speculum*, which brings into view the walls of the vagina and the lower part of the cervix, and thus facilitates examination, applications to, and operations upon the vagina, uterus, and neighboring parts. There are many varieties; the most important are:

(1) *Simple Tubular, or Ferguson's*, consisting of a cylinder of glass, plain or reflecting, of metal, porcelain, wood, or hard rubber. They are not used as extensively now as they were formerly. (Fig. 3.)

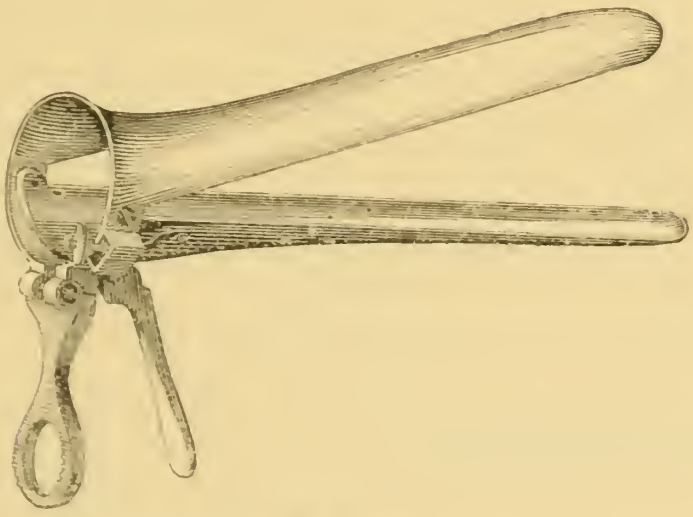
Fig. 3.

Ferguson's speculum.

(2) *The Segmented Tubular.*—A common variety is Cusco's, or some modification of Cusco's. They are bivalve, trivalve, or quadrivalve. They are introduced sideways; the blades should be kept closed until entirely within the vagina, then turned and opened, when the cervix will be brought into view; the blades are kept expanded and in place by means of a screw or other similar device. Care should be taken not to include any hairs or portions of the mucous membrane of the vulva in the joints or screws of the speculum. In withdrawing, the blades should be allowed to close, then turned sideways and withdrawn gently. (Fig. 4.)

These instruments are largely used, their advantage being that they are self-retaining, and hence require no

Fig. 4.



Cusco's speculum.

assistant. They are used for examination and applications only—never or very rarely for operation.

(3) *Sims's or Univalve.*—This is, properly speaking, a perineal retractor; it consists of two blades, "duck-

Fig. 5.

Sims's speculum.

bill" in shape, separated by a curved connecting portion; one blade is inserted into the vagina, and supports the posterior wall and perineal body, whilst the

anterior vaginal wall falls forward with the abdominal viscera, from gravity, on account of the position of the woman. (Fig. 5.) It is introduced in *Sims's position* as follows:

Drawing up the right buttock and labium, introduce the blade, well lubricated, guiding it by the right index-finger placed in the hollow of the blade, along the posterior wall; pass up to the hollow of the sacrum, and then draw upward—not toward coccyx, but obliquely across the nates—and then have it held by an assistant standing behind the patient. The bladder and anterior vaginal wall often project backward so as to impede the view—these are pushed away by the retractor, and the cervix may be drawn down by a tenaculum. It is well to have the woman's clothing previously loosened about the waist.

There are several modifications of Sims's speculum, so as to make it self-retaining and to do away with the necessity of an assistant; the best of these are Hunter's & Mann's.

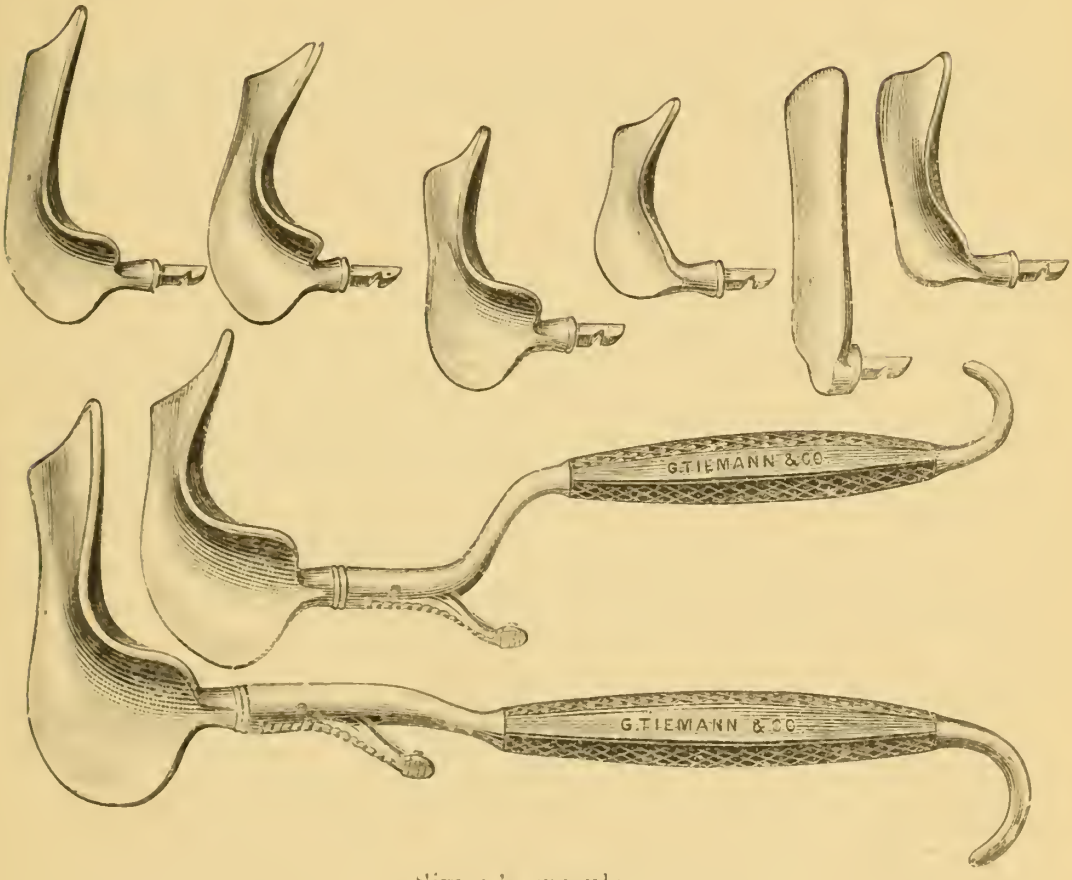
Occasionally, when used to explore the vesico-vaginal septum, it may be advisable to place the woman on the knees and hands, to get a better view of the anterior vaginal wall.

(4) *Simon's* is a perineal retractor similar to Sims's, having the blade and handle separate, so that different sized blades can be used. It is also arranged to retract the anterior vaginal wall, and can be used either with patient on the back or on the side. (Fig. 6.)

(5) *Combination Specula*, which can be used as bivalve or trivalve with woman on back, or changed into Sims's. Some of these combinations of Cusco's and Sims's, variously modified, answer for both; but they

are not used as extensively as the plain Sims's or Cusco's and its modifications.

Fig. 6.



Simon's specula.

In examining, with the aid of the speculum, the mucous membrane must usually be cleansed by cotton or sponge, applied with the *uterine dressing forceps*, or *sponge or cotton-holder*.

Other Instruments: The principal other instruments are the sound, probe, dressing forceps, sponge-holder, retractor, tenaculum, cervical dilator, curette, fountain-syringe, tampon, and pessary. This enumeration does not include the instruments for special operations, which will be mentioned when these operations are described.

The Sound (Simpson's) is a long, flexible, graduated metal rod, with a bulbous extremity at the free end and a handle at the other. (Fig. 7.)

Fig. 7.

Simpson's sound.

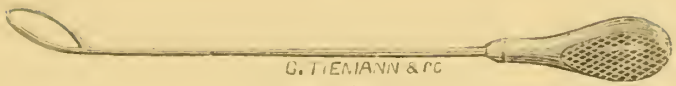
The Probe is like the sound, but is more delicate, slender, and pliable, resembling an ordinary surgical probe with a handle; it is made of metal or of hard rubber, and is considered safer for general use than the sound.

When either the probe or the sound is introduced, it is better done without the aid of the speculum, as follows: Introduce the fingers of the left hand to the external os, and then with the right hand introduce the sound (or probe) through the cervix, using the left hand as a guide. There should be absolutely no force used in introduction. A real or suspected case of pregnancy contraindicates the use of the sound or probe.

These two instruments give us information regarding the direction and length of the uterus, and the patency and size of the external and internal os, and of the cervical canal. They should, previous to introduction, be bent to correspond to the supposed curve of the uterine canal, and in the normal uterus pass up for a distance of from two and a half to three inches.

The Retractor is a solid or fenestrated blade upon a long handle, intended to push aside the anterior vaginal wall when Sims's speculum is used. (Fig. 8.)

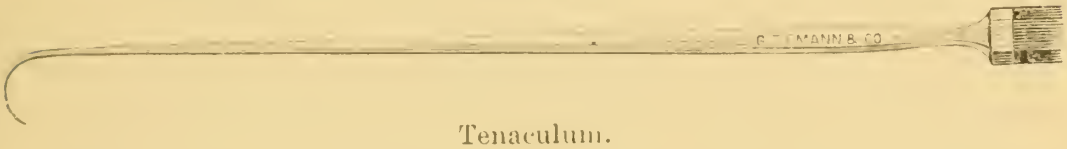
Fig. 8.



Sims's retractor.

The Tenaculum is a square or round-hooked instrument upon a long shaft, with which parts are brought into view, or steadied in examinations or operations. (Fig. 9.)

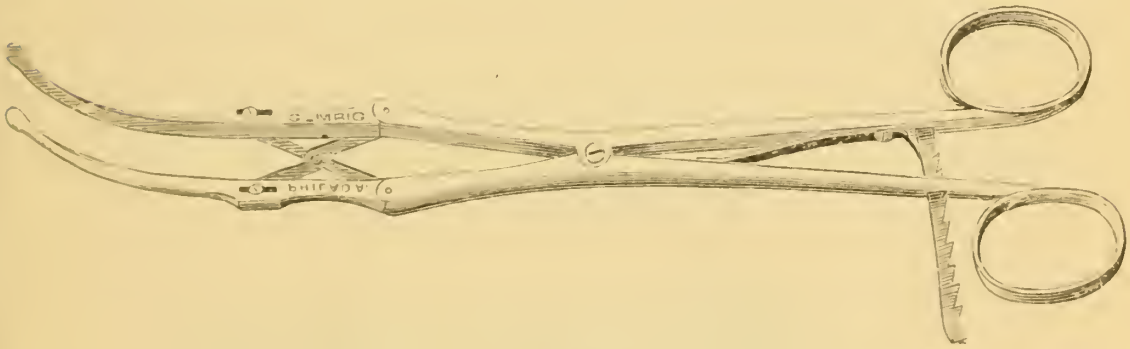
Fig. 9.



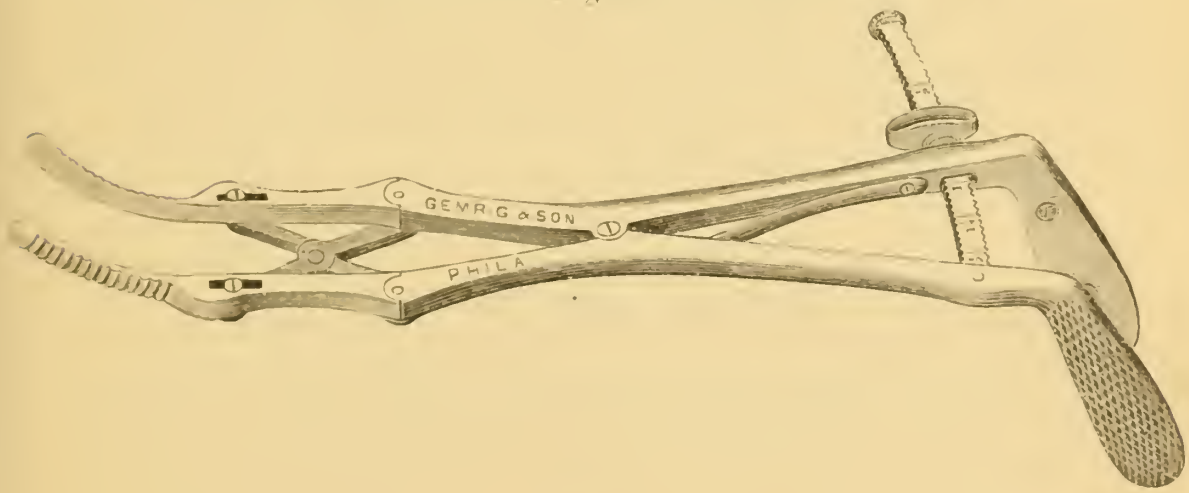
Tenaculum.

The Cervical Dilator, as its name implies, is used in forcibly enlarging the cervical canal; it is shaped

Fig. 10.



Light.



Heavy.

Goodell-Ellinger's dilator.

somewhat like a glove-stretcher. Goodell's (Fig. 10) and Wylie's are those most commonly used.

Curettes are either *sharp* or *blunt*. For diagnostic purposes we use the blunt instrument, as devised by Thomas (Fig. 11), consisting of a handle upon which is

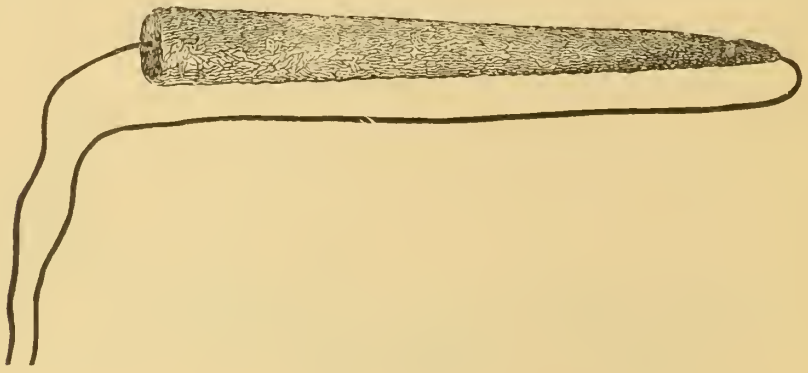
Fig. 11.

Thomas's dull curette.

mounted a flexible metal rod provided with a blunt, looped extremity. When carefully used, it is not likely to injure the soft tissues, and is very useful in removing granulations of the endometrium and in scraping away portions of tumors, etc., for microscopical examination and diagnosis.

Tents are contrivances for dilating the canal of the cervix uteri, for examination or treatment of the cavity of the uterus, or in obstetrics. They are made of com-

Fig. 12.



Sponge tent.

pressed sponge, laminaria or sea-tangle, and of tupelo. The last two varieties are fast superseding those made of sponge; for, although they do not expand quite as

readily and quickly, they are smoother, and present less danger of exciting sepsis from absorption of detached and putrid particles. (Figs. 12, 13.)

Fig. 13.

Sea-tangle tent.

To insert tents, woman is placed on back or in Sims's position, a speculum being usually employed; they are curved, if necessary; a piece of string is attached to them to facilitate removal; they should be covered with carbolized vaseline before insertion, and should not be left in longer than twenty-four hours. It is important that they be passed through the os internum. The woman should be in bed when they are introduced, and should remain there for twenty-four hours after removal. The vagina should be washed out before and after their use with some antiseptic liquid. They should be inserted gently; two or three small ones act better than one large one. They should never be used in cases of recent perimetric inflammation. Even when all these precautions have been observed, there is some risk connected with their use—they may excite pelvic peritonitis, cellulitis, septicæmia, endometritis, and shock.

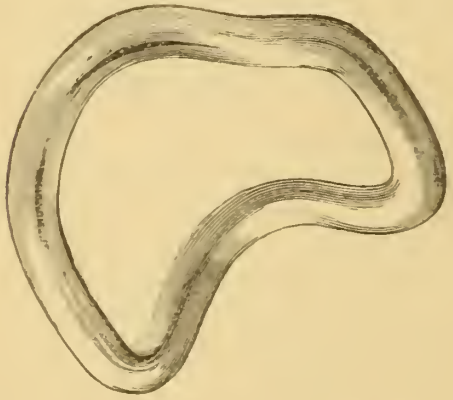
Vaginal Tampons consist of disks of cotton, plain or medicated, used to prevent or check hemorrhage from the uterus, or occasionally the vagina, or sometimes to retain intra-uterine instruments and to correct uterine displacements. The individual disks may be joined together with a cord, or, better, are introduced

separately; they are first packed around the cervix, and then into the vagina, so as to fill it thoroughly, being retained by a T-bandage. This proceeding is always done with the aid of the speculum, and Sims's is preferable. Tampons should not be left in longer than forty-eight hours. Then they should be removed with the aid of the speculum, one by one, or by means of Sims's screw. Lampwick has been suggested as a good material for tamponing, by Dr. Frank Foster.

The Fountain Syringe.—For vaginal injections, we use the fountain syringe with a nozzle containing several lateral openings (but none at the tip). The water should be used hot (100°-110° F.), and corrosive sublimate (sufficient to make a solution 1 : 2000 or 1 : 5000) or carbolic acid (℥ss-℥j to Oj) may be added. The woman is placed near edge of bed, with hips elevated and lower extremities flexed; the nozzle of syringe or tube should be made so as to give a reverse current, to prevent the entrance of fluid into the uterus, and should be directed posteriorly behind the cervix.

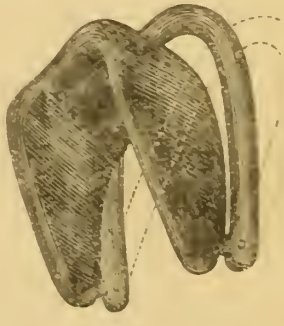
Pessaries are instruments made usually of hard rubber, occasionally of soft rubber, glass, or metal, intended to correct mechanically uterine displacements. (Figs. 14, 15.)

Fig. 14.



Hodge pessary for posterior displacements.

Fig. 15.



Thomas's anteversion pessary.

CHAPTER II.

AFFECTIONS OF THE VULVA.

Anatomy of the vulva—Malformations of the vulva—Hypertrophy of the vulva—Pudendal hernia—Tumors of the vulva—Hydrocele—Abscess and cysts of vulvo-vaginal gland—Vulvar hæmatocele—Urethral venous angioma—Urethral caruncle—Inflammations of the vulva—Purulent vulvitis—Follicular vulvitis—Abscess of labium—Gangrenous vulvitis—Diphtheritic vulvitis—Eruptions of the vulva—Neuroses—Pruritus—Dyspareunia—Vaginismus—Coccygodynia—Fissure of vulva—Prolapse of urethral mucous membrane—Vulvar hemorrhage—Rupture of hymen.

Anatomy of the Vulva.—The female organs of generation are divided into (1) external, (2) internal, (3) vagina, which connects the two. The external organs of generation, also known as the "*vulva*" or "*pudendum*," comprise the mons veneris, labia majora, labia minora, clitoris, vestibule, urethra, meatus urinarius, fossa navicularis, fourchette, hymen and carunculæ myrtiformes, and ostium vaginæ.

The mons veneris is a mass of adipose, cellular, and fibrous tissue, covered by integument, and after puberty with hair, placed upon the front of the symphysis pubis and horizontal rami of the pubes, varying in prominence according to the degree of projection forward of the pubes and the obesity of the individual, and abundantly supplied with sweat and sebaceous glands.

The labia majora are two folds extending from the mons veneris above, where they are thick, and form the anterior commissure, downward and backward, to one and a half inches in front of the anus, where they

unite and form the posterior commissure. They are covered externally with skin and hairs, and have numerous sebaceous follicles; internally they are formed of mucous membrane, containing sebaceous and muciparous glands. Between its two surfaces, the substance of each labium majus is formed of connective, adipose, and elastic tissue, and of some smooth muscular fibres, which are arranged in the form of a sac, continuous above with the external inguinal ring, and regarded as analogous to the dartos of the scrotum, and called the "*dartoid or pudendal sac;*" it contains fat, connective tissue, and some fibres from the round ligament of the uterus, and is occasionally the seat of inguinal hernia, through the perviousness of the usually closed canal of Nuck.

The labia minora or nymphæ are formed entirely of mucous membrane, beneath which are bands of connective, muscular, and areolar tissue, vessels and nerves, sebaceous and muciparous glands, and vascular papillæ, and they are covered by tessellated epithelium. They arise above by two roots, the upper pair forming the prepuce of the clitoris, the lower its frænum. Below, the nymphæ are lost in the labia majora, at about the middle of the latter. In the child and in old age they project in front of the labia majora.

The fourchette is a strip of mucous membrane stretched across from one labium majus to the other, just behind (above) the posterior commissure; it is usually torn in labor.

The fossa navicularis is the small depression existing (when the parts are separated) between the fourchette and the posterior commissure.

The clitoris is a small mass of erectile tissue situated one-half inch below the anterior commissure; it is one

inch long when erect, and is the principal seat of sexual orgasm in the female. It resembles the penis, consisting of a glans and body, the latter being divided into two corpora cavernosa separated by a septum, and connected with the pubes by a suspensory ligament and two crura; the glans is covered above by the prepuce, and below by the frænum, both of these being formed by the roots of origin of the nymphæ. The clitoris possesses two muscles, the erector clitorides or ischiocavernous muscles, and is richly supplied with vessels and nerves.

The vestibule is a triangular surface, seen on the upper aspect of the vulva, bounded behind by the upper margin of the ostium vaginæ, the sides by the diverging nymphæ, its apex being formed by the clitoris. It is smooth, contains no sebaceous follicles, but many muciparous glands, and presents about its centre.

The meatus urinarius, the external opening of the urethra.

The urethra is one and a half inches long, very dilatable, and is directed from before backward, and from below upward.

The hymen is a fold of mucous membrane varying in form, most often crescentic, stretched across the ostium vaginæ, usually incomplete, the opening left differing in shape, lost usually at first intercourse, but it may persist, and it may be absent in the virgin. It is always removed at parturition.

The caruncule myrtiformes have been proven by Schroeder to be the remains of the hymen after parturition; they consist of from three to five fleshy prominences occupying the site of the hymen.

The ostium vaginæ is the opening to the vagina, varying in size, small in the virgin, more or less circular in

shape, and placed a little nearer the symphysis pubis than to the coccyx, so as not to be exactly in the axis of the inferior strait of the pelvis.

Vascular Supply of the Vulva.—This is very abundant, and constitutes an erectile tissue, which is especially marked at the bulbs of the vestibule.

(*a*) *Arterial supply* is derived from:

(1) Internal pudic—its superficial perineal, artery of the bulb, artery of the corpus cavernosum, and dorsal artery of the clitoris branches.

(2) Internal iliac—some offsets from vaginal branches.

(3) Femoral—its superficial and deep external pudic branches.

(*b*) *Venous supply* is similar to the arterial, and, in addition, there are certain peculiar arrangements:

(1) Bulbs of vestibule, an elongated cluster of dilated venous vessels, one inch in length, situated on each side of the ostium vaginæ, in contact below with the vulvo-vaginal glands, internally with the mucous membrane of the vagina, externally with the bulbo-cavernous muscle. It forms an erectile mass, erection being produced by compression of the efferent veins by the ischio-cavernous muscle.

(2) Pars intermedia, consisting of a double row of veins between the glans clitoridis and the bulbs of the vestibule.

Glandular supply of the vulva is also quite abundant.

(*a*) *Sebaceous glands* are found upon the mons veneris, inner surface of the labia majora, and on the labia minora, especially near the clitoris.

(*b*) *Muciparous glands* are very abundant around the meatus urinarius and glans clitoridis, but are also

found on the inner surface of the labia majora, and on both surfaces of the labia minora.

(*c*) *Vulvo-vaginal glands*, also known as glands of Bartholin, or Duverney, or Huguier, are two conglomerate elongated glands, about the size of an almond, contained in a fibrous envelope; they are situated on each side of the ostium vaginæ, beneath the superficial fascia of the perineum, in relation internally with the mucous membrane of the vagina, externally in contact with the bulbo-cavernous muscle, and superiorly with the bulbs of the vestibule. They are the analogues of Cowper's glands in the male, and secrete a glairy, tenacious fluid, which is ejaculated at the time of the orgasm in the female, and at other times aids in lubricating the vulva; their ducts, about one and a half inches long, open just in front of the hymen, or carunculæ myrtiformes.

Nervous supply of the vulva is very abundant, and consists of branches of the sympathetic, genito-crural (from lumbar plexus), inferior pudendal (from small sciatic), and pudic (from sacral plexus). The clitoris is provided with tactile corpuscles.

Muscles of the Vulva.—Two muscles deserve special mention, being peculiar to the female:

(1) *Bulbo-cavernosi*, two muscular bands, one on each side of the ostium vaginæ, arising behind from the perineal body, and passing forward around the opening of the vagina, covering the bulbs of the vestibule, and inserted by three subdivisions into the under surface of the corpus cavernosum of the clitoris, the posterior part of the urethra, and the mucous membrane near the clitoris.

(2) *Ischio-cavernosum or erector clitoridis* is a narrow band of muscular fibres on each side, arising from the

internal surface of the tuberosity of the ischium, and inserted into the posterior and internal aspects of the crus clitoridis.

The Affections of the Vulva may be divided into—

1. Malformations.
2. Hypertrophy.
3. Hernia.
4. Tumors.
5. Inflammations.
6. Eruptions.
7. Neuroses.
8. Unclassified.

Malformations of the Vulva.

1. Atresia vulvæ. See description of "Atresia of the female genital tract and its results."

2. Atresia ani vestibularis, in which rectum opens into vestibule.

3. Hypospadias.

4. Epispadias.

5. Hermaphroditism.

a. True—when both sexual organs are present—very rare.

b. False—when the external organs of one sex are malformed, so as to simulate those of the opposite sex. In the female, usually due to hypertrophy of the clitoris and approximation of labia majora. In the male, to hypospadias, or, more rarely, to epispadias.

Hypertrophy of the Vulva.

1. Hypertrophy of the labia majora. Elephantiasis (in Hindoo women).

2. Hypertrophy or increased number of labia

minora. Hypertrophy of the nymphæ is said to be the result of masturbation. When hypertrophied and very long, they may form the so-called "Hottentot aprons."

3. Hypertrophy of clitoris. This is often found in cases of nymphomania. The operation of clitoridectomy (amputation of clitoris) has been performed for the cure of this disease, but with unsatisfactory results.

Treatment of Hypertrophy of the Vulva.—Local applications, such as hot sitz-baths, lotions, iodoform, salicylic acid, etc., may first be tried; at best, however, very little benefit can be expected from such remedies. The hypertrophied portion may be removed with knife, scissors, or the Paquelin thermo-cautery.

Labial or Pudendal Hernia.

Definition.—A protrusion of some part of the abdominal contents into the pudendal sac. It follows the course of the round ligament, through the unclosed process of peritoneum surrounding the latter—the canal of Nuck. It is of rare occurrence. The contents of the sac are intestines, ovary, mesentery, omentum, bladder, or uterus.

Etiology.—The *predisposing cause* is the perviousness of the canal of Nuck. The *exciting causes* are those which operate also in the male: muscular efforts, strains, blows, falls, etc.

Symptoms.—We find an elastic tumor at the upper part of the labium majus of one side. This is painless (unless inflamed), presents an impulse on coughing and resonance on percussion. It may present all the symptoms of inguinal hernia in the male, and, like it, may become inflamed, irreducible, obstructed, and

strangulated. The patient usually complains of nothing but some discomfort on locomotion.

DIFFERENTIAL DIAGNOSIS.—From abscess, hæmatocele, œdema, hydrocele, and solid tumors of labium.

TREATMENT.—Return by taxis and apply a proper truss. If complicated by strangulation of gut, etc., treat as in the male.

Tumors of the Vulva.

These include the following:

1. Cystic tumors of labium.
   - *a.* Hydrocele of canal of Nuck.
   - *b.* Hydrocele of labium.
   - *c.* Cysts of vulvo-vaginal gland.
2. Vulvar hæmatocele.
3. Urethral venous angioma.
4. New growths:
   - Urethral caruncle.
   - Venereal warts (papillomata).
   - Condylomata.
   - Chancre.
   - Chancroid.
   - Gummata.
   - Lipomata.
   - Carcinomata.
   - Sarcomata.
   - Myxomata.
   - Fibromata.
   - Neuromata.
   - Osteomata. } (Very rare.)
   - Enchondromata. }
   - Lupus.

Hydrocele of the Labium.

Hydrocele is very rare in the female; it consists of an accumulation of serous fluid in the inguinal canal, around the round ligament in the unclosed canal of Nuck; it is treated as in the male.

Abscess and Cyst of Vulvo-vaginal Gland.

Definition.—A suppurative inflammation, or a retention cyst of the vulvo-vaginal gland.

Etiology.—Same as that of vulvitis—it often follows the latter.

Pathology.—In abscess, a suppurative inflammation of the parenchyma; in cyst, an occlusion of the duct causing retention of the secretion, enlargement and distention of the gland.

The gland of one side only is usually involved.

Symptoms.—Same as those of vulvitis, excepting that the swelling is more defined, solid, and usually one-sided; later there is fluctuation.

A cyst can be distinguished from abscess by its development without inflammation, and by absence of sensitiveness.

Differential Diagnosis.—From vulvitis, abscess of labium, hernia, hæmatocele, œdema, hydrocele, and prolapse of the ovary.

Course.—Tends to recover quickly, after evacuation of pus or cyst contents. Duration two or three weeks.

Treatment.—At first same as for vulvitis. When pus has formed, evacuate it where fluctuation is most marked. If the sac fills up again with pus or cystic material, a radical operation is necessary; lay open the sac, and wash out, and cauterize with nitrate of silver

or the actual cautery; or cut out an elliptical piece from the sac wall, and plug with carbolized cotton; rarely is extirpation of the entire gland necessary.

Vulvar Hæmatocele.

Definition.—A tumor formed by the escape and collection of blood into the connective tissue of one labium, or about the vulva, by the rupture usually of one of the veins forming the bulbs of the vestibule.

Synonyms.—Pudendal hæmatocele. Pudendal hæmatoma or thrombus.

Occurrence.—It may occur in the unimpregnated woman, but is rare, and usually then due to direct violence. Or it may occur before, during, or after labor.

Etiology.—Same as that of vulvar hemorrhage.

Symptoms.—Locally, we find a rapidly formed purple tumor in one half of the vulva. There is pain, and if the loss of blood be considerable, symptoms due to this. When it occurs during labor, it is most likely to occur just at the close of second stage, from pressure of the head; and its size may be such as to block up the passage of the pelvis.

Course.—It may become absorbed, or burst externally, or become encysted, or it may form an abscess, and then may set up purulent infection.

Differential Diagnosis.—From œdema of labium, hernia, abscess, hydrocele, cyst or abscess of vulvo-vaginal gland. Differentiation from these is easy.

Treatment.—Keep woman quiet, in recumbent posture; if tumor is small, cold lead and opium lotion. If the hemorrhage be very large, or as a result abscess has formed, lay open the sac on the mucous side, wash

out clots, and plug with lint; if hemorrhage continues, soak the lint in iron subsulphate; then apply a compress and T-bandage for three or four days.

If occurring during labor and child is alive, deliver with forceps if possible; if child is dead, perforate or crush head, and deliver rapidly; then treat as in non-puerperal cases.

If after these proceedings hemorrhage still persists, cauterize the cavity with the actual cautery, and plug as before.

Urethral Venous Angioma.

A disease due to venous congestion, causing a tumefaction of the anterior half of the urethro-vaginal septum. It is non-sensitive. Its treatment is similar to that of urethral caruncle.

Urethral Caruncle.

Definition.—A raspberry-like growth, composed of one or more small vascular elevations, situated at the meatus urinarius; they are very sensitive, and thus give rise to pain upon the slightest provocation.

Occurrence.—Most frequently at menopause; but may occur in young and old.

Etiology.—Unknown.

Pathology.—A tumor composed of bloodvessels, held together by fibrous tissue, covered by epithelium, and abundantly supplied by nerves. They bleed easily, and are very sensitive. They are usually situated at the meatus, but may extend up into the urethra. Their size varies from that of a pea to that of a pigeon's egg.

Symptoms.—Frequent micturition or retention.

Pain on micturition.

Pain on locomotion.

Pain on coition or contact.

Nervous symptoms may develop as a result of pain and annoyance, just as in pruritus vulvæ.

Physical Signs.—We find a tumor, as above described.

Course.—They do not tend to heal or disappear spontaneously, and hence, without treatment, last many years. If the urethra be invaded, the chances of complete relief from treatment are not as good as in ordinary cases, on account of the difficulty of reaching the tumor.

Treatment.—(*a*) *Palliative*, if woman will not consent to an operation, cauterize with nitrate of silver. Also use urethral suppositories of belladonna, opium, iodoform, hydrocyanic acid, or combinations of these.

(*b*) *Radical.*—Anæsthetize woman completely, or inject three to five minims of a four per cent. solution of cocaine muriate; seize caruncle near base with forceps, draw down, and cut off with scissors; control the ensuing free hemorrhage by touching with silver nitrate, nitric acid, or the actual cautery (Paquelin); the last is preferable, since it cauterizes the base at the same time, and thus tends to prevent return of growth. Cicatrical contraction of the urethra may result, and require dilatation.

Venereal Warts.

Definition.—Warty growths almost always, though not necessarily.

Occurrence.—Usually in adults. Most common in prostitutes and in those of uncleanly habits.

Etiology.—Due to the irritating effects of gonorrhœal, syphilitic, or other discharges.

Pathology.—They are papillomata, and consist of a delicate connective-tissue framework with large blood-vessels, covered with a thickened layer of epidermis.

Varieties.—They are divided into the soft and hard varieties, a difference chiefly due to the amount of moisture to which they are subjected.

Course.—They are apt to grow unless checked. During pregnancy they grow rapidly, and spread far up into the vagina. The warts will recur after removal, unless the irritating discharge is cured.

Treatment.—The treatment consists in removing the growths with the scissors or cautery, if they are of large size. If small and seen early, it will be sufficient to insure cleanliness by means of frequent vaginal injections of bichloride of mercury (1 : 5000) and by washing the external genitals with a solution of 1 : 1000. The parts should be kept dry with equal parts of calomel and alum, or equal parts of bismuth and iodoform, or salicylic acid.

Condylomata.

These are of syphilitic origin, and are sometimes called gummatous or mucous tubercles or patches. They are essentially of the same nature as venereal warts, but have less connective tissue in their structure; they are due to specific infection, and consist of inflamed and hypertrophied papillæ; they may, however, be found in situations devoid of papillæ. They first appear on the inner surface of the labia.

The local treatment is the same as for venereal warts; the patient should also, of course, be put upon specific treatment.

Inflammations of the Vulva.

Vulvitis is an inflammation of the mucous lining of the vulva; secondarily, the inflammation may extend into the submucous and surrounding parts.

The different forms of vulvitis met with are:

1. Purulent.
2. Follicular.
3. Phlegmonous. (Abscess of labium.)
4. Gangrenous.
5. Diphtheritic.

Purulent Vulvitis.

Definition.—An inflammation of the mucous membrane of the vulva, involving all the constituents of the lining membrane.

Varieties.—It may be (*a*) *non-specific*, or *simple;* (*b*) *specific* or *gonorrhœal.*

Etiology.—Vaginitis (simple or gonorrhœal).

Want of cleanliness.

Injury.

Chemical irritants.

Friction from exercise (especially in hot weather).

Awkward or excessive coition.

Masturbation.

Exposure to cold.

Pregnancy.

Menopause.

Eruptions on vulva.

Parasites: (*a*) pediculi pubis; (*b*) scabies; (*c*) oxyuris vermicularis.

Exanthemata.

Diabetes.

Cancer.

Lupus.

Leucorrhœa.

Pathology.—There are, at first, congestion and dryness, the latter soon being succeeded by a discharge of mucus, pus, and serum, and increased desquamation of epithelium—if this is very excessive, superficial ulceration may result; rarely, diphtheritic patches may be added.

Secondarily, the inflamation may extend to the vagina, bladder, urethra, or vulvo-vaginal glands. In the gonorrhœal variety, the vagina, meatus, and urethra are very apt to be involved.

Symptoms:

(*a*) *Constitutional.*—The severity of these will depend upon the acuteness of the inflammation. If mild and subacute, there will be scarcely any; if severe and painful, there may be fever, with its symptoms, and marked discomfort and irritability; this is, however, unusual.

(*b*) *Local.*—The vulva is red, hot, swollen, dry for about twenty-four hours, and then bathed in a profuse, offensive, purulent *discharge* of a viscid or creamy character, and a yellow color. There is a varying amount of *pain* on locomotion or coition; if the meatus be affected, there will be added pain and scalding on micturition. *Itching* is often complained of, and this may excite the patient to rub the parts, and this in turn increases the inflammation. If the vagina or other parts are secondarily involved, then the symptoms of inflammation of these parts will be added. Contact with the discharge, even if non-specific, will excite a very formidable purulent ophthalmia, and may excite urethritis in the male, which will resemble gonorrhœa.

Course.—Usually runs a limited course, and if the exciting cause be removed, tends to get well of itself; occasionally it becomes chronic and obstinate. It responds well to treatment, and the latter usually shortens its course considerably.

Treatment:

Removal of cause is of primary importance.

Rest.—If the inflammation be very severe, keep in bed; if not severe, patient should be kept quiet; no locomotion or coition.

Warm general baths.

Diet should be low, non-stimulating. No highly seasoned food nor alcoholics.

Catharsis by saline purgatives.

Mineral water (*saline*) in considerable quantity.

Locally. Absolute cleanliness. Generally best to avoid ointments, or fats. *Bathe* the *vulva* freely with water every few hours. Also apply *mildly astringent lotions*, such as *lead and opium wash:*

℞ —Liq. plumb. subacet. }
Tinct. opii } . . . . . āā ℥j.
Aquæ . . . . . Oj.—M.

Sig.—External use.

This is best applied by disks of soft linen or lint, or a *poultice* of bread, slippery elm, or flaxseed may be used.

After the acute symptoms have passed, and there is a tendency for the case to become subacute or chronic, paint over the vulva with:

℞—Liq. ferri subsulph. . . . . ℥j.
Glycerini. . . . . ℥vij.—M.

Sig.—Apply several times a day,

or use a 2 per cent. solution of *nitrate of silver* every second day.

For the pruritis, a ½ per cent. solution of *carbolic acid* may be used, or some of the other remedies mentioned in speaking of this disease.

Follicular Vulvitis.

Definition.—An inflammation of the vulva, involving chiefly its glands, but, to a less extent, also the other parts of the mucous membrane. It is also known as "vulvar folliculitis;" it is much less common than the purulent variety.

Etiology.—Same as that of purulent vulvitis.

Pathology.—The disease may affect chiefly the muciparous glands, or chiefly the sebaceous follicles, or both together; there is usually some purulent general inflammation associated.

Symptoms.—Same as those of purulent vulvitis, excepting there is more pain, and the local appearances are different: These are the formation of small, rounded, elevated papules, very sensitive and often presenting purulent apices, especially in involvement of the sebaceous follicles; they are found on the surfaces of the labia majora and minora, and especially around the meatus and clitoris. They may discharge spontaneously and then heal.

Course.—Does not tend to be cured spontaneously, as does the simple purulent variety; if neglected, may become quite obstinate; if properly treated, rarely lasts beyond two or three weeks.

Treatment.—Same as that of purulent vulvitis. Dr. Oldham's

℞.—Ac. hydrocyan. dil. . . . . ℥ij.
Plumbi subacet. . . . . gr xx.
Ol. cacao . . . . . ℥ij.—M.

Sig.—Apply after thorough cleansing.

Applications of subsulphate of iron and glycerin, or 2 per cent. nitrate of silver, especially to the seat of the inflamed follicles; if it becomes chronic, the solid stick of nitrate of silver or copper directly to the involved follicles.

Abscess of Labium.

Definition.—An inflammation of the labia majora, resulting in the formation of furuncles or boils.

Etiology.—(*a*) *Predisposing*, the state of the system known as the "furuncular diathesis."

(*b*) *Exciting*, in those thus predisposed, any of the causes enumerated under purulent vulvitis.

Pathology.—At first congestion, then in a day or two increased swelling and hardness, which then goes on to suppuration and formation of abscess.

Symptoms.—Heat, redness, swelling, throbbing pain, especially on exercise, and sensitiveness of one labium.

Differential Diagnosis.—From simple vulvitis, abscess and cyst of vulvo-vaginal gland, labial hernia, pudendal hæmatocele, labial œdema, hydrocele, and prolapse of an ovary.

Course.—If properly treated, yields readily; if pus is not evacuated, it may burrow into surrounding parts and do mischief.

Treatment.—In acute stage, that of purulent vulvitis. In second stage, when suppuration is unavoidable, promote the formation of abscess by warm poultices.

When pus is seen or known to exist, it should be evacuated; open on inner surface of labium.

Then treat the diathesis by fresh air, iron, quinine, nux vomica, other tonics, hypophosphites, and calcium sulphide.

Gangrenous Vulvitis.

Gangrenous Vulvitis is confined to children, occurring after scarlet fever, measles, and typhoid fever.

Diphtheritic Vulvitis.

Diphtheritic vulvitis is usually one of the manifestations of puerperal fever.

Eruptions of the Vulva.

These are very numerous; those most commonly seen are:

Eczema.
Acne.
Herpes.
Prurigo.
Lichen.
Erythema.
Erysipelas.
Syphilides.

They regularly induce vulvitis, and often a very troublesome pruritus, and show a tendency to become chronic.

They should be treated just the same as when occurring elsewhere.

Neuroses.

These include:

1. Pruritus vulvæ.
2. Dyspareunia.
3. Vaginismus.
4. Coccygodynia.

Pruritus Vulvæ.

Definition. – A hyperæsthetic condition of the nerves of the vulva, which gives rise to an intense itching, and an almost irresistible desire to rub and scratch the parts. It is a symptom, rather than a disease.

Etiology.—(*a*) *Predisposing causes:*

Disease of neighboring parts: vulva, vagina, urethra, uterus, etc.
Pregnancy.
General depreciation of health.
Indolent, luxurious, and enervating habits.
Syphilis.
Gouty and rheumatic diathesis.
Bright's disease.
Menopause.

(*b*) *Exciting causes:*

Irritating discharges from leucorrhœa, especially uterine, and often when only slight.
Cancer.
Incontinence of urine.
Diabetes.
Gonorrhœa.
Strongly acid or alkaline urine.
Local inflammation and irritation of vulvitis.
Vaginitis.
Eruptions.
Parasites—pediculi pubis, scabies, oxyuris vermicularis.
Masturbation.
Venereal warts.
Urethral caruncle.
Want of cleanliness.

Pathology.—This symptom is supposed to be due to an irritability and sensitiveness of the nerves supplying the vulva; it is thought by many to be dependent, in most cases, on some centric neurotic cause.

Symptoms.—*Itching*, which is often intolerable, and, as a secondary result, if unrelieved, may give rise to chorea, sleeplessness, opium habit, despondency, hysteria, and general loss of health; and, locally, as a result of scratching, to various ulcerations, excoriations, eruptions, and inflammations. The disease or symptom comes on gradually, and, if unrelieved, becomes worse, on account of the increased irritation due to scratching. It is often intermittent, and is especially apt to be marked at the menstrual epoch, or by anything which causes congestion of the genitals, such as coition; getting into a warm room or bed, eating spiced food, or drinking stimulants, often excite it. It may be more marked at one period of the day than at another. From the vulva, it may extend to the abdomen, groin, or down inner side of thighs.

Treatment. *Treat the Cause.*—Remove, if possible, the exciting or predisposing cause. Where there are irritating discharges, frequent ablutions are indicated.

To relieve the symptoms, there is an endless variety of drugs in use. The most commonly used, and most highly spoken of, are:

(1) Two to five per cent. solution of nitrate of silver.
(2) Two to three per cent. solution of carbolic acid.
(3) Half per cent. solution of mercuric chloride.
(4) Twenty-five to fifty per cent. solution of sulphurous acid.
(5) Four per cent. solution of boric acid.
(6) Ointments of camphor, tar, or iodoform.
(7) Mixture of camphor and chloral.
(8) Infusion of tobacco.
(9) Chloroform dissolved in almond oil (1 : 5).

(10) ℞.—Extr. opii . . . . . gr. v.
Plumb. acet. . . . . gr. x.
Ac. hydrocyan. dil. . . . . ʒj.
Aquæ . . . . . ad ℥j. M.
Applied on lint to vulva.

(11) ℞.—Liq. plumbi subacet. . . . . ℥j.
Ac. hydrocyan. dil. . . . . ℥j.
Aquæ . . . . . ad Oj.—M.

(12) ℞.—Ac. tannici . . . . . ʒij.
Extr. belladon. . . . . gr. x.
Butyr. cacao . . . . . ʒv.—M.
Div. in suppos. No. xx. Sig.—Insert one into the vagina night and morning.

(13) ℞.—Sodii biborat. . . . . ʒij.
Morph. sulph. . . . . gr. vj.
Aquæ rosæ . . . . . ℥vij.
Sig.—Apply to vulva on lint.

Dyspareunia.

Definition.—Painful or difficult coition; the term expresses a symptom only.

Etiology.—Absence of vagina.
Atrophy of vulva or vagina.
Eruptions upon vulva.
Vulvitis.
Urethral caruncle.
Fissure of vulva.
Fissure of anus.
Stenosis of vagina.
Arch of pubes too deep.
Vaginitis.
Elongated cervix.
Uterus set too low in pelvis.
Too short vagina.
Disparity in development of opposite organs.
Inflammation from awkward intercourse.

Inflammation of uterus.
Inflammation of uterine appendages.
Inflammation of periuterine tissue.
Prolapse of ovary.
Coccygodynia.
Hysteria.
Vaginismus.

There are many other causes, but the above are the most frequent. Many of them are irremediable; others are amenable to treatment, and are spoken of in other parts.

Vaginismus.

Definition.—Reflex contraction of the muscular fibres surrounding the orifice of the vagina—probably the bulbo-cavernous muscle (pubo-coccygeus—Savage), and perhaps the anterior fibres of the levator ani, when coition is attempted.

Etiology.—Irritable fossa navicularis.
Inflamed hymen.
Unruptured hymen.
Irritable carunculæ myrtiformes.
Urethral caruncle.
Prolapse of the ovary.
Fissures of vulva.
Vulvitis.
Vaginitis.
Ulcers of vulva.
Pelvic cellulitis.
Fissure of anus.
Large size of male organ.
Hysterical diathesis.

Symptoms.—Dyspareunia and sterility. It is most common in young married women.

Prognosis.—Good, if properly treated.

Treatment.—If a *local cause* can be found, this must be *removed;* if excoriations, fissures, or ulcers, cauterize by actual cautery or nitrate of silver, and apply iodoform or belladonna.

When these proceedings do not remove the condition, or when no local cause can be found, *palliative treatment* in the form of sitz baths and sedative injections may be tried, but is generally of no avail; then we must *dilate* the *vagina*, best by the wearing of a wooden or glass dilator for an hour or two daily, increasing the size gradually, and smearing them with belladonna ointment; though painful at first, their introduction soon becomes easy.

If these fail, or sometimes, even before trying gradual dilatation, we may perform *Sims's operation:* The patient being anæsthetized, an incision about two inches long is made on each side, extending from half an inch above ostium to raphé of perineum, obliquely; the entrance of vagina is plugged to check hemorrhage, and next day a glass dilator, having a groove above for the meatus and passage of urine, is introduced smeared with belladonna ointment; this must be worn two hours, night and morning, for three or four weeks; or the sphincter may be forcibly stretched by passing the thumbs or fingers into the vagina and pressing outward until the fibres give way.

The pudic nerves have been divided for the cure of this affection, but it has not yet been done to any great extent, and is not generally advocated.

During these various forms of treatment, intercourse should be abstained from.

If hysteria be an etiological factor in the case, tonics, change of air, open-air exercise, etc., are indicated.

Coccygodynia.

Definition.—This rather common symptom is the occurrence of pain in the region of the coccyx on rising or sitting.

Synonyms.—Coccygodynia. Painful sitting. Neuralgia of the coccyx.

Etiology.—(*a*) *Constitutional causes:*

Gouty or rheumatic diathesis.
Hysteria.
Neuralgic diathesis.

(*b*) *Local causes:*

Cold and exposure.
Local neuralgia.
Rheumatism.
Caries of coccyx.
Inflammation of coccyx.
Displacement of coccyx.
Fracture of coccyx.
Periostitis of coccyx.
Rupture of sacro-coccygeal ligament.
Hyperæsthesia.
Falls and blows.
Affections of neighboring parts:
- Fissure of anus.
- Fissure of vulva.
- Uterine disease.
- Ovarian disease.
- Disease of any of pelvic contents.
- Constipation.
- Hemorrhoids.

Pathology.—The pain is caused by the movements of the coccyx, which is rendered sensitive by disease

of the bone itself, its attachments, or surrounding parts.

Symptoms.—*Pain* at tip of coccyx, in rising or sitting down, stool, walking, sudden exertions, sexual intercourse, etc. This pain varies in degree; it is sometimes excruciating, and when long continued gives rise to deterioration of the health.

Diagnosis.—Pressure of the skin over the coccyx, or movement of it by pressure through the rectum, causes the characteristic pain.

Treatment. (*a*) *General.*—If anæmic, or the gouty, hysterical, rheumatic, or the neuralgic diathesis exists, treat this.

(*b*) *Local.*—Endeavor to remove the cause.

If you cannot discover any cause, as often happens :

(1) Employ suppositories, ointment or plaster of opium and belladonna.

(2) Leeches over coccyx.

(3) Blisters over coccyx, followed by dusting with morphine.

(4) Hypodermic injections of morphine over coccyx.

(5) Galvanism to coccyx and surroundings.

(6) If these do not suffice, cut away all attachments of coccyx to sacrum and neighboring parts, by subcutaneous incisions with small tenotomy knife.

(7) As a last resort, remove the coccyx by a posterior median incision.

In addition to the preceding diseases of the vulva there are several other affections and conditions of this organ which cannot properly be classified. Among these are included fissure of vulva, prolapse of the urethral mucous membrane, hemorrhages of the vulva, and rupture of hymen.

Fissure of Vulva.

Definition.—A small superficial ulcer, usually situated at posterior commissure, less frequently at the anterior, occasionally laterally.

Symptoms.—Pain on locomotion, micturition (from contact with urine), and coition, and sometimes even while at rest.

Treatment.—Cauterize with nitrate of silver; if this does not cure it, make a slight incision to base of ulcer, and allow it to heal from the bottom, the woman being kept quiet until it is entirely healed.

Prolapse of the Urethral Mucous Membrane.

This is uncommon. It may be mistaken for urethral caruncle, and gives rise to the same symptoms. The treatment consists in removal of the prolapsed portion, and keeping a catheter in the urethra until the wound heals.

Hemorrhages of the Vulva.

There are three forms:

1. Vulvar or pudendal hemorrhage.
2. Vulvar or pudendal hæmatocele (already described).
3. Hemorrhage from ruptured hymen.

Vulvar or Pudendal Hemorrhage.

Definition.—Hemorrhage from the vulva, in which the blood escapes externally; source of blood is usually the bulbs of vestibule.

Etiology.—(*a*) *Predisposing Causes.* Pregnancy. Dilatation of veins.

(*b*) *Exciting Causes.* Direct violence, most frequently.
Wounds.
Severe muscular efforts.

Symptoms.—Locally, we find an abrasion or larger rent of the mucous membrane, and from this, blood, usually venous, exudes in various degrees of profuseness.

It may be complicated with pudendal hæmatocele.

If the amount of blood lost be small, there may be no constitutional symptoms whatever, excepting a certain amount of fright and some pain. But if the amount lost be considerable, we will have the usual symptoms due to this; it is even possible for these symptoms to terminate in collapse and death. The severity of the symptoms depends (1) upon the amount of blood lost, and (2) the rapidity of its loss.

Treatment.—Cold and pressure.

Tampon vagina, then apply cold compresses, or iron subsulphate to the bleeding parts, and secure with pressure by a T-bandage; keep woman quiet in bed. If the hemorrhage does not cease, enlarge the opening, turn out clots, and apply solution of iron subsulphate.

Rupture of Hymen.

This usually takes place at first intercourse, and the resulting hemorrhage is generally slight; it may, however, be quite extensive, and require the application of iron subsulphate or even tamponing the vagina.

CHAPTER III.

THE PERINEAL BODY.

Anatomy—Rupture of—Results of rupture—Operations for restoration (perineorrhaphy)—Tait's operation of perineorrhaphy—Prolapse of vagina—Prolapse of bladder—Prolapse of rectum—Prolapse of intestines—Colporrhaphy—Emmet's operation.

Anatomy.—This is a triangular mass, composed of areolar, adipose, and fibrous tissue, and muscular attachments, situated between the lower part of posterior wall of vagina and lower portion of anterior wall of rectum; the mucous membrane of these canals forms its anterior and posterior walls, whilst below, it is covered by the integument extending between the posterior vulvar commissure and the anterior wall of anus, which tract is often called the *perineum*. It measures about an inch and a half vertically, and transversely and antero-posteriorly at its base. It is of great importance on account of its function, which is to support the pelvic viscera, and especially the anterior rectal wall and anterior and posterior vaginal walls; hence the numerous and significant effects resulting from the removal of this perineal support, in rupture of the perineum, so called.

Rupture of the Perineal Body.

Definition.—A rent of greater or less extent through the perineal body.

Occurrence.—It is of very frequent occurrence.

Varieties.—It may be divided into:

(*a*) *Partial.*

(*b*) *Complete.*

Or divided into four degrees, as follows:

First degree, extending through mucous membrane of vagina for a short distance only; a superficial rupture of the fourchette and perineum.

Second degree, extending to the sphincter ani.

Third degree, extending through the sphincter ani.

Fourth degree, extending through the sphincter ani and involving the recto-vaginal septum.

Etiology.—In the great majority of cases it is due to lacerations inflicted during *childbirth;* occasionally a loss of the perineal body is caused by senility, subinvolution after parturition, general debility and pressure from a displaced uterus.

Causes of Rupture of Perineal Body during Parturition.—

Passage of large heads.

Passage of occipito-posterior vertex presentation.

Passage of other malpositions and malpresentations.

Passage of shoulders of child.

Narrow and too acute pubic arch.

Straight sacrum.

Excessive uterine contractions.

Ulcerations of perineum from syphilis.

Rigid perineum in elderly primiparæ.

Unguarded use of forceps.

Too early passage of hand into vagina to bring down arm in turning.

Awkward manipulation in supporting perineum.

Results.—(*a*) *Immediate.*—Hemorrhage.

Septicæmia, from absorption of putrid discharges.

(*b*) *Distant.*—Subinvolution of vagina.

Prolapse of vagina.

Cystocele.
Rectocele.
Enterocele.
Displacements of uterus, including prolapse.
Incontinence of feces and gases (in complete rupture).

Treatment.—Although we have this alarming array of serious consequences of ruptured perineum, yet it must be remembered that many cases experience no evil effects whatever, even where the rupture is considerable. This fact, though of interest, does not justify us in neglecting to repair the damage done immediately after parturition, for most authorities agree that it is advisable to repair a ruptured perineum immediately after the third stage of labor.

A rent of less than half an inch usually requires no treatment; but when more than this, sutures should be employed to keep the freshly separated surfaces in apposition; for, although a tear of one inch often heals spontaneously, yet this favorable issue cannot be depended on.

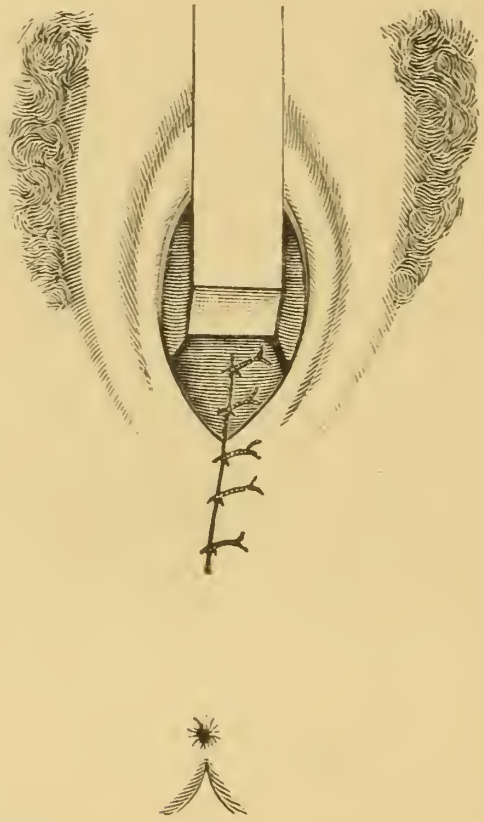
Perineorrhaphy.

Operations for the Restoration of the Perineal Body.—This operation is called *primary* when it is done immediately after parturition; *secondary*, when done after the immediate effects of childbirth have passed. It varies also according to whether the rupture be partial or complete.

Primary Operation.—Is advisable, no matter what degree of laceration exists; it should be done immediately after the third stage of labor, when the parts are still somewhat benumbed from pressure, and when, since the accident occurs very often after instrumental

delivery, the woman is still under the influence of an anæsthetic. The steps are the same as in the secondary operation, but much easier, since all the tissue is present and no denudation required.

Fig. 16.



Recent inside tear and repair by sutures.

Secondary Operation; Partial Rupture.—The woman should be prepared for three weeks previous; the general health improved by tonics, fresh air, and nutritious diet; for a week previous she should receive a cathartic daily, in order to prevent the existence of hard fecal masses; for four or five days previous the diet should consist largely of animal broths, and not of milk, which tends to form hard masses in the rectum; any existing leucorrhœa should be cured, and the

vagina washed out twice a day for a week before the operation.

The woman is placed in the lithotomy position; four assistants are needed: first, anæsthesia; second and third, to hold thighs apart; and, fourth, to hand sponges, etc. Instead of general anæsthesia, a 4 per cent. solution of muriate of cocaine may be used, four minims being injected on each side of floor of vagina, and the surface of vaginal floor repeatedly painted over with the same solution.

The labia are held apart and thus the floor of the vagina put upon the stretch.

The instruments required are long curved scissors, narrow bistoury, long tooth forceps, tenaculum, sponges on holders, artery forceps, needle-holder, silk and catgut ligatures, strong silver wire, straight and curved round needles two and a half inches long.

Notch a point in the posterior wall of the vagina corresponding to the desired extent of denudation; this forms the middle of a concave base to the triangular surface to be denuded; the apex corresponds to a point just above the anus, and the sides extending from this point in a convex outward direction to a point midway up labium majus, and the base being concave upward and extending from this point on each side to the notch in the posterior median line before mentioned; this surface is to be denuded with scissors or knife (gynecologists prefer scissors), removing as little tissue as possible. Slight hemorrhage will cease spontaneously; but if the bleeding vessel can be seen, it should be seized and twisted if small, tied with catgut if large. After cessation of hemorrhage, the exposed surfaces on the two sides are to be held in apposition, preferably with wire sutures. The number of sutures required

depends upon the size of the rupture and the operation; from three to six are usually required.

A round needle (the ordinary darning-needles are best) is threaded double, and to this is looped the silver wire; the entrance of the first suture should be at the inferior border of the exposed surface, and all sutures should be put in and come out one-quarter to one-half inch from the lateral margins, between which points they should pass beneath the denuded area; the finger in the rectum guards them from passing too deeply and wounding the gut; the upper one or two sutures should pass through the angle of the surface of one side and catch up the corresponding angle on the other side, without being embedded beneath the stripped surface. The sutures are now approximated, tightened, and twisted upon a fulcrum, cut off at about two inches, and the combined ends covered by a piece of soft rubber tubing.

The after-treatment consists in keeping the woman in bed, with the knees bound together, on her back or side; the urine should be drawn every six hours, and the vagina kept clean; on the eighth or ninth day the sutures are removed. The diet during this period should consist chiefly of broths; the bowels are kept constipated for four days after the operation, and then moved by enema or mild laxative.

Secondary Operation; Complete Rupture.—Here it is of great importance to close the rent in the gut and to unite the ends of the divided sphincter; upon these points depends, in great measure, the success of the operation.

As a rule, if more than an inch of the rectum be ruptured, it is best to close this by denuding the edges

and uniting them down to the anus, and after these parts have been united, to operate further.

The divided sphincter should be united as follows: After vivifying the parts, pass in a needle at the lower edge of the anus, then upward through the recto-vaginal septum encircling the rent, and bring it out at the side of the lower edge of the anus opposite the point of entrance; this suture is then tightened; the sphincter now usually unites; then proceed as in partial rupture.

There have been numerous other operations devised for the repair of a lacerated perineum, most of them being merely modifications of the operation just described.

The best known are those of Emmet, Tait, Simon, Bischoff, Hegar, Fritsch, and Hildebrandt.

Tait's method has lately been used quite extensively; it is done with the woman in an exaggerated lithotomy position. Mr. Tait describes it as follows:

Having the folds of the buttocks firmly pulled apart so that the cicatrix is put on the stretch, I enter the point of the scissors at its extreme end on one side, and keeping strictly to its line, I run through to its other extremity. The incision is about $\frac{3}{8}$ of an inch deep and forms two flaps, a rectal and a vaginal. From each end of the incision, it is carried forward into the tissue of each labium for about an inch, and again backward for about $\frac{1}{3}$ of an inch. The flaps thus formed extend forward into the vagina and backward into the rectum. Sutures are then introduced from the rectum, from the vagina, and from the cutaneous surface, and are left *in situ* for three or four weeks, the vagina and rectum being washed out daily.

Tait claims to have had only two failures in many hundred cases.

Prolapse of the Vagina.

Definition.—Prolapsus vaginæ is a bulging of the wall of the vagina into its canal, toward or even through the vulva.

Occurrence.—It is usually accompanied by displacement of adjacent viscera—bladder, rectum, intestine, and uterus—but rarely occurs by itself. When it does occur by itself, it more frequently affects the posterior than the anterior vaginal wall. It is very rare in nulliparæ.

Etiology.—Repeated parturitions.

Subinvolution of vagina and perineum.

Rupture of perineum.

And occasionally by senile atrophy of vagina.

Chronic vaginitis.

Previous distention of vagina by tumors.

Violent efforts of the abdominal muscles.

Symptoms.—(When vagina alone is displaced.)

Uncomfortable and bearing-down feeling in vagina.

Feeling of heat and fulness in vulva.

Pelvic discomfort on locomotion or muscular exertion.

Woman becomes easily tired.

Physical Signs.—We find a tumor covered by vaginal mucous membrane, which may be congested, inflamed, and excoriated, or smooth, tough, shining, and covered by a proliferation of the normal pavement epithelium.

When complicated by prolapse of neighboring parts, the physical signs and the symptoms of these will be added.

Course.—This condition presents itself under two forms: *acute*, which is very rare, and *chronic*, the usual form.

The acute variety is often cured by replacement, posture, and rest.

The chronic and usual form has a tendency, unless there be surgical interference (medical treatment being usually of no avail), to a lengthy duration, and to become complicated very soon by prolapse of the uterus, bladder, rectum, and (rarely) intestines.

Prolapse of the Bladder.

Definition.—Displacement and falling of the bladder downward into the vagina, toward the vulva.

Synonyms.—Cystocele. Vesico-vaginal hernia.

Etiology.—It is usually secondary to, or occurs with, prolapse of the anterior wall of the vagina, and is produced by removal of the support which the vagina should give, and also directly by traction.

It has the same causes as has prolapsus vaginæ, and hence is also usually found in multiparæ. A small pouch is first formed; this retains a portion of the urine, and thus soon enlarges and forms a diverticulum.

Symptoms.—Besides the symptoms of vaginal prolapse, there is decomposition of the retained urine, causing a cystitis, which gives rise to vesical pain and tenderness, frequent, painful, and scalding micturition, changes in the urine, and deterioration in general health.

Course.—These symptoms continue until the condition is relieved by operation; the regular evacuation of the bladder by catheter, with the palliative treat-

ment, detailed later on, may make the patient pretty comfortable.

Prolapse of the Rectum.

Definition.—A bulging of the rectum into the vaginal canal, toward or through the vulva.

Synonyms.—Rectocele. Recto-vaginal hernia.

Etiology.—Same as that of cystocele and prolapsus vaginæ.

Symptoms.—Those of prolapsus vaginæ; in addition, symptoms due to inflammation of the rectal mucous membrane—pain and tenesmus, frequent passages of mucus mixed with blood, constipation, and deterioration in general health.

Course.—Symptoms continue until the condition is removed by operation.

Prolapse of the Intestines.

Definition.—An encroachment upon the vaginal cavity by the descent of part of the small intestine. This usually takes place in Douglas's cul-de-sac, very rarely between bladder and uterus and anterior vaginal wall.

Synonyms.—Enterocele. Entero-vaginal hernia.

Etiology.—Same as that of prolapsus vaginæ.

Symptoms.—Those of prolapsus vaginæ. There exists a possibility of strangulation or contusion during labor.

Course.—Symptoms continue until relieved by operation.

Treatment of Prolapse of Vagina, Bladder, Rectum, and Intestines.—(*a*) *Local astringents.*

Injections of sea-water, and water containing tannic acid or other vegetable astringents, or zinc sulphate, or

alum, into the vagina two or three times a day; or the use of vaginal suppositories containing astringents. These means may be of service in very slight examples, but never in well-marked cases.

(*b*) *Improvement of general health.*

Change of air, exercise, sea-bathing, the use of iron, quinine, and other tonics; these are adjuvants in those very slight cases in which local astringents are used; by their use the tone and strength of the abdominal muscles are increased.

(*c*) *Removal of pressure from above—*

Such as tight lacing and heavy clothes suspended from the hips; the former should be forbidden, and the weight of the skirts should be borne by the shoulders.

(*d*) *Supplemental support.*

An abdominal bandage with perineal pad is often of service in very stout women. Certain pessaries, such as Cutter's cup, may be of service, by supporting the uterus, pushing it up, and thus making the vagina tense, and preventing its prolapse, together with that of adjacent organs. A Hodge pessary, with crossbars across its lower end, may be of use.

(*e*) *Surgical procedures.*

There is scarcely any case which will not yield to one of the following operations:

1. Perineorrhaphy.

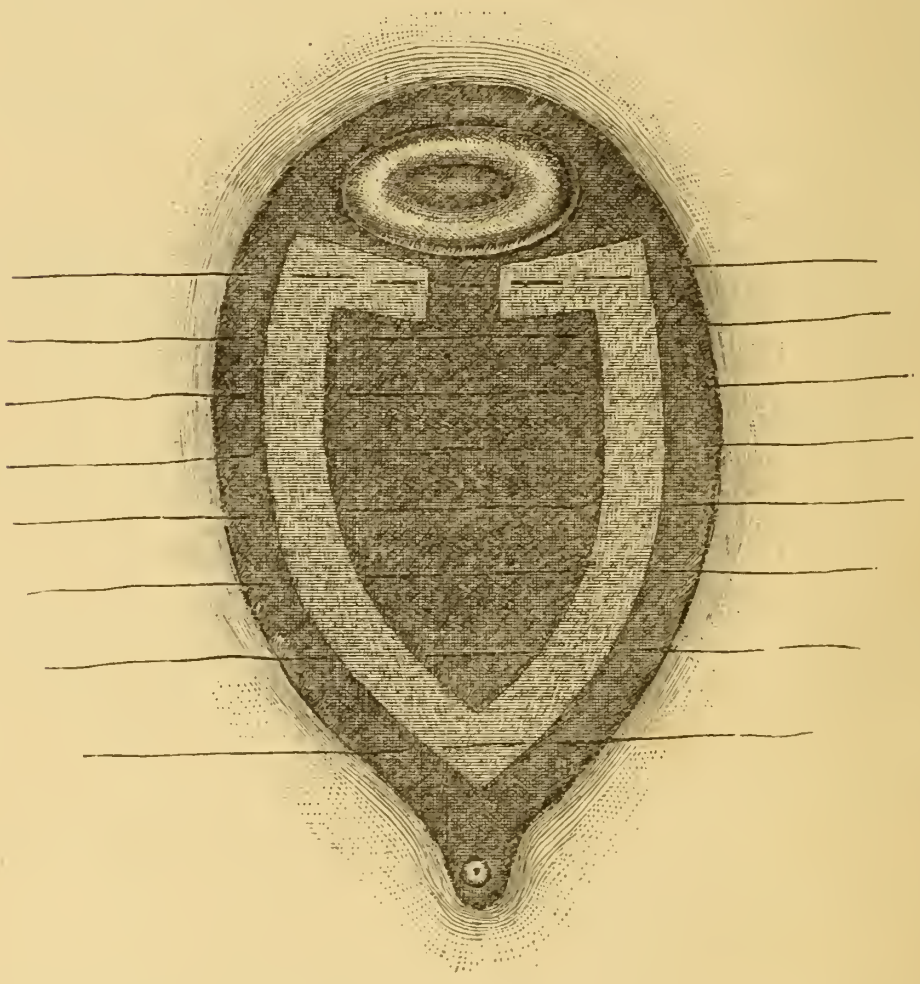
2. Colporrhaphy upon the anterior or the posterior vaginal wall—whichever is at fault.

3. Colporrhaphy upon both vaginal walls, even though only one seems to be at fault; this is done when the two preceding operations are insufficient.

4. Colpo-perineorrhaphy, a combination of perineorrhaphy, with anterior or posterior colporrhaphy, or both.

Colporrhaphy or Elytrorrhaphy.—This is an operation effecting a diminution in the calibre of the vagina, and thus removing the traction which its prolapse exerts upon surrounding organs.

Fig. 17.



Sims's operation.

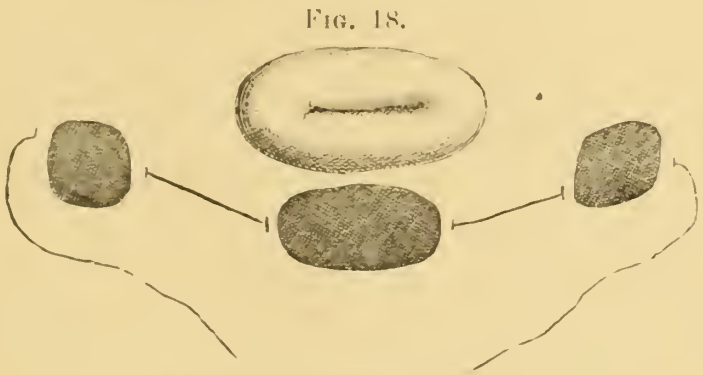
The operation now usually performed, is that introduced by Sims, or some modification of this, of which Emmet's is the best example and one frequently performed. It is designated as anterior or posterior colporrhaphy, according to whether the anterior or

posterior wall of the vagina is operated upon; we can operate upon both.

In *Sims's operation of anterior elytrorrhaphy*, the woman being placed in Sims's position, a V-shaped denudation is effected, the apex being just above the meatus, and the ends of the arms on each side of the cervix; thus two strips of mucous membrane are vivified, and the ends of the arms almost united by transverse lines; the denuded surfaces are approximated by silver suture, and the after-treatment is the same as for perineorrhaphy; the sutures are removed at the end of ten to fourteen days.

Emmet's operation. In this modification a patch of mucous membrane at a proper distance to one side of the cervix is caught up with a tenaculum and excised with scissors. The other side is treated in the same manner, as is also a patch on the posterior wall of the cervix.

Fig. 18.

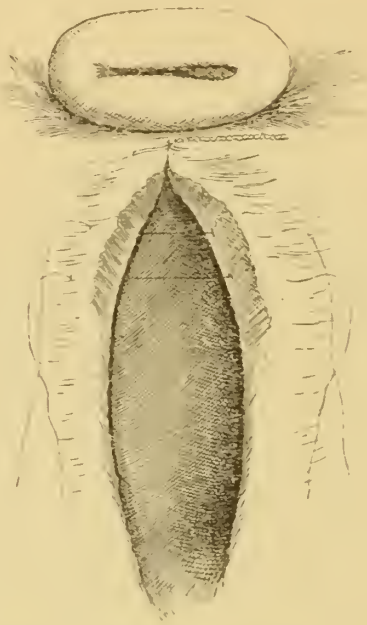


Emmet's operation; first step.

A wire suture is then passed so as to bring these three denuded points together, and twisted so as to fix them. Catching up a piece of mucous membrane on the vaginal fold, a strip is cut out and sutures passed across it from the margins of each side, proceeding, step by step, from above downward. In this way a great loss of blood is avoided; the opposing abraded surfaces are thus

immediately and accurately brought together without danger of passing the suture so that the coaptation will not be symmetrical (Figs. 18, 19).

Fig. 19.



Emmet's operation; second step.

In all these varieties, the silver sutures are passed beneath the denuded mucous membrane, and then brought together and twisted, as in perineorrhaphy; and the after-treatment is the same.

When the anterior vaginal wall is to be operated upon, Sims's position is desirable; when the posterior wall, the lithotomy position, with the lateral walls of vagina strongly retracted.

CHAPTER IV.

AFFECTIONS OF THE VAGINA.

Anatomy of the vagina—Malformations of the vagina—Displacements of the vagina—Tumors of the vagina—Inflammations of the vagina—Acute simple vaginitis—Subacute and chronic simple vaginitis—Specific vaginitis—Granular vaginitis—Mycotic vaginitis—Tubercular vaginitis—Senile vaginitis—Croupous and diphtheritic vaginitis—Leucorrhœa—Fistulæ of the female generative organs—Urino-genital fistulæ—Fecal fistulæ—Simple vaginal fistulæ—Foreign bodies in the vagina.

Anatomy of the Vagina.

The vagina is the canal of communication between the vulva and the uterus, serving for the passage of the penis and semen, of the menstrual secretion, and of the child.

It is in relation, in front, with the base of the bladder and the urethra; behind, with the rectum, being connected with its anterior wall for the middle three-fifths, with the perineal body at the lower fifth, and separated by Douglas's pouch of peritoneum from the rectum at its upper fifth; laterally, it is in relation and gives attachment, above to the broad ligaments, and below to the levatores ani muscles and recto-vesical fascia.

It is situated in the cavity of the pelvis, its direction almost corresponding with the axes of the pelvic cavity. In its natural relation, it is flattened, forming on section an H. Its length is two and a half inches along its anterior, and three inches along its posterior wall,

in the virgin. It is narrow below, but wide above, where it embraces the cervix uteri.

It consists of three coats:

(1) *Internal or Mucous*, consisting of a stroma of connective tissue, upon which are placed deeply cylindrical and superficially squamous epithelium; this is studded with vascular papillæ, and contains numerous muciparous glands (though this is disputed). The secretion of the vagina is acid, and this prevents coagulation of the menstrual secretion. The mucous membrane is elevated into a ridge on the anterior, and a similar one on the posterior surface, from which numerous transverse rugæ proceed; these are most marked near the orifice, and tend to become obliterated from frequent intercourse, old age, parturition, and chronic vaginitis.

(2) *Middle or muscular layer*, consisting of two layers, an internal longitudinal, continuous with that of uterus, and an external circular, which near the ostium vaginæ forms an aggregation often called the sphincter vaginæ. These two layers are connected by interlacing oblique fasciculi.

(3) *External layer*, consists of loose connective tissue, in which are some muscular fibres, and a large number of veins, forming a sort of erectile tissue.

The *blood supply* of the vagina is very abundant; the arteries are the vaginal, and branches from the uterine, vesical, and internal pudic; the veins correspond to the arteries and terminate in the hypogastric.

The *nerve supply* is also very free, being derived from the hypogastric plexus of the sympathetic, and branches from the pudic and fourth sacral nerves.

The Affections of the Vagina

may be divided into:

1. Malformations.
2. Displacements.
3. Tumors.
4. Inflammations.
5. Fistulæ.
6. Foreign bodies in the vagina.

Malformations of the Vagina.

1. Congenital atresia of vagina, simple or lateral.
2. Absence of vagina.
3. Abnormally short and narrow vagina.
4. Split or double vagina.
5. Congenital cloaca of vagina.

They are due to some abnormality in the method of union of the "Müllerian ducts." They will receive further consideration under "Atresia of the Female Genital Tract and its Results."

Displacements of the Vagina.

1. Inversion of anterior vaginal wall with cystocele.
2. Inversion of posterior wall with rectocele. It may also be complicated with ovariocele or enterocele.
3. Hydro-, or pyo-colpocele.

The treatment of these displacements has been described in the preceding chapter, under colporrhaphy.

Tumors of the Vagina

include:

(1) Cysts.

(2) Solid tumors:

Fibroid.
Carcinoma.
Sarcoma.
Fibromyoma.
Myoma.
Papilloma.
Polyps.

Cysts of the Vagina.

Occurrence.—Not infrequent. They are usually single, and situated low down; they are more frequent on the anterior than on the posterior wall.

Etiology.—Probably due to involution of the mucous membrane of the vagina; others have been attributed to dilatation of canals of Gärtner, and thrombi.

Pathology.—Their size varies from that of a small nut to that of a hen's egg; their wall is lined by columnar epithelium; the contents vary from clear to dark brown, and from a serous to a thick mucous consistence.

Symptoms.—When small, no symptoms. When large, they may cause bearing-down pain, leucorrhœa, and dyspareunia, or, rarely, interfere with micturition and parturition.

Diagnosis is easy; they are to be differentiated from cysts of the vulvo-vaginal glands, hæmatocele, and hernia.

Treatment.—If interference be called for, puncture and injection of iodine, excision of a portion of the sac, incision and cauterization of the sac-walls, or cutting out a portion and uniting the margins of the rest to the adjoining surface of the vagina, may be practised.

Fibroids, Myomata, and Fibromyomata.—These tumors are rare, vary in size, may be sessile or pedunculated (polypi), and only when of large size do they give rise to annoyance, from compression of surrounding parts, or blocking up of vagina. They may be removed quite readily by enucleation, and by division of the pedicle in polypi.

Carcinoma may be primary or secondary (usually secondary). When primary it is most frequently found on the posterior vaginal wall. The growth may be circumscribed or diffuse. The symptoms are the same as those of cancer of the cervix: Pain, hemorrhage, offensive discharge, and constitutional effects of cancer. It occurs in younger individuals than does that of cervix. In certain cases, removal can be effected by caustics, cautery, or the knife.

Sarcoma occurs very rarely; it may be diffuse or circumscribed, in the latter case being usually a fibrosarcoma, and occurring in the form of a polypus. In either case, it should be removed.

Inflammations of the Vagina.

Synonyms.—Vaginitis. Colpitis. Elythritis.

Varieties.—The common ones are:

(1) Simple vaginitis { Acute. Subacute. Chronic.

(2) Specific or gonorrhœal vaginitis.

The less common ones are:

(3) Granular vaginitis.

(4) Mycotic vaginitis.

(5) Tubercular vaginitis.

(6) Senile or adhesive vaginitis.

(7) Croupous and diphtheritic vaginitis.
(8) Abscess of the vagina.
(9) Gangrene of the vagina.
(10) Erysipelas of the vagina.

Acute Simple Vaginitis.

Definition.—A purulent inflammation of the vaginal mucous membrane, not due to gonorrhœa.

Etiology.—Neglect of cleanliness.
Exposure to cold during menses.
Contusion during parturition.
Exanthemata (in children).
Injuries from pessaries.
Excessive coition.
Irritating injections.
Chemical agents.
Irritating discharges from uterus.
Introduction of foreign substances.
Ascarides (in children).
Dentition in childhood.
General debility, in phthisis, etc.

Pathology.—There are marked congestion and swelling of the mucous membrane of the vagina: for the first day or two there are dryness and suppression or diminution of the natural secretion, after this period there is increased secretion, and this creamy purulent discharge consists of pus cells, vaginal epithelium, granular matter, and bacteria, suspended in serum. There is increased desquamation of the lining pavement epithelium, and this may be so much in advance of reproduction, that superficial ulceration results.

Symptoms.—(*a*) *Local.*—Profuse yellowish or greenish offensive discharge from vagina.

Heat and burning in vagina.

Pain on locomotion or coition.

Feeling of weight in perineal region.

Pain and fulness in pelvic region.

Excoriations upon vulva and surroundings.

Pruritus vulvæ (in some cases).

If urethra be involved, as is sometimes the case even in the simple variety, there will be added

Frequent desire to micturate.

Pain and scalding in micturition.

(*b*) *Constitutional.*—More or less constitutional disturbance, such as we have accompanying a local inflammation in any part of the body :

Rise of temperature.

Increased rapidity and fulness of pulse.

Headache

Restlessness.

Anorexia.

Constipation.

More or less prostration.

Physical Signs.—The vulva and vagina are swollen, congested, and tender; after thirty-six hours the discharge occurs, and often there are superficial abrasions and ulcerations. The cervix may also be involved.

Differential Diagnosis.—The only affection with which, after examination of the parts, it might be confounded, is gonorrhœal vaginitis.

Complications.—Urethritis, cystitis, endocervicitis, endometritis, salpingitis, and pelvic peritonitis.

Treatment.—Rest and cleanliness.

Patient should go to bed; no sexual intercourse; saline cathartics to move the bowels; light non-stimu-

lating diet. If considerable constitutional disturbance, give ℥j deodorized tincture of opium, in a tablespoonful of spirits of Mindererus every three hours. If complicated with urethritis, an abundance of some saline mineral water, such as Vichy, lithia, etc.

Locally, suppositories of belladonna and opium one-half grain extract of each in rectum, p. r. n., and hot-water douches every four to six hours; the parts should be kept clean.

Under this treatment the condition will usually disappear entirely in a week or two; it may, however, be followed by the subacute and chronic forms.

Subacute and Chronic Forms of Simple Vaginitis.

These forms may follow an acute attack or be so from the outset. The same causes exist as in the acute variety; also the same symptoms, but to a less degree and unaccompanied by constitutional disturbance, excepting some deterioration of general health, due to the constant discharge.

The treatment is entirely local; it consists in painting the walls of the vagina, exposed by a speculum, with ten or twenty grains to ounce solution of nitrate of silver, and afterward tamponing with cotton soaked in carbolized glycerin; astringent douches of tannin, alum, borax, etc., may also be used.

Specific or Gonorrhœal Vaginitis.

Definition.—An acute and virulent form of acute vaginitis, always due to contamination with gonorrhœal virus.

Symptoms.—Those of a severe case of acute vaginitis.

Differential Diagnosis.—The following points will tend to differentiate the attack from the simple form: There is more commonly an involvement of the urethra in the inflammation, and hence greater scalding and pain in micturition; more frequent desire to urinate.

The local inflammatory symptoms are more marked.

The constitutional symptoms are more marked.

The presence of the micrococcus gonorrhœa in the discharge.

But it must be admitted that differentiation from the simple variety is difficult, and sometimes impossible; especially, since a simple acute vaginitis may excite urethritis in the male, which cannot be distinguished from gonorrhœa; but it is not so likely to be contracted by the male as is the specific variety. The micrococcus gonorrhœa is not peculiar to gonorrhœal virus.

Duration.—Somewhat longer than the simple form; if properly treated, two or three weeks.

Complications.—These are more common than in the simple form; they may be very severe, and even fatal. They are: Buboes, abscess of vulvo-vaginal gland, abscess of labium, urethritis, cystitis, pyelitis, pyelonephritis, endocervicitis, endometritis, salpingitis, and peritonitis.

Treatment.—Same as in simple vaginitis.

In all forms of vaginitis, but especially in the specific variety, patients must be warned of the dangers resulting from inflammations of the conjunctiva, by contact with the discharges from the vagina.

Rarer Forms of Vaginitis.

Granular Vaginitis.—This is a rare form, usually found in pregnancy, the pathology of which consists of hypertrophy of the muciparous follicles of the vagina. The existence of these glands being disputed, the occurrence of this form of vaginitis is denied by many. The symptoms and treatment are the same as in simple vaginitis.

Vaginitis Mycotica.

Definition.—Mycotic vaginitis is a form ot inflammation of the vagina dependent upon the growth of germs.

Occurrence.—It is comparatively rare, as the vagina is not a favorable seat for the development of germs.

Etiology.—Catarrhal inflammations of the vagina and the pregnant state are predisposing causes; it is claimed that intercourse when the husband has diabetes is also a cause.

Pathology.—Besides the lesions of simple acute and chronic catarrhal vaginitis, we find two forms of microorganisms: *leptothrix vaginalis* and *oïdium albicans.*

Symptoms.—The *leptothrix vaginalis* produces scarcely any symptoms. The *oïdium albicans* causes burning and itching, increased discharge and swelling; these symptoms are intensified at night. Upon local examination, we find a condition resembling stomatitis; there are reddish or whitish-yellow spots upon the mucous membrane, and these cannot be removed. Several spots may coalesce, but they never cover large areas (never larger than size of a pea). Under the microscope the germ can easily be recognized.

Prognosis.—Favorable.

Treatment.—Injections of sulphate of copper (10 per cent.), carbolic acid (2 per cent.), corrosive sublimate (1 : 2000) are useful. Also local applications of salicylic ointment or carbolized vaseline. A powder composed of equal parts of bismuth subnitrate and iodoform, dusted on night and morning, will relieve the symptoms promptly.

Tubercular Vaginitis is rare. It is accompanied by the development of tubercle bacilli, as in other parts of the body. It is usually secondary, but recently several cases of primary tuberculosis of the vagina have been reported.

Senile or Adhesive Vaginitis.—This variety is sometimes seen, occurring after the menopause; the pathology consists in the desquamation of the epithelium of the upper part of the vagina in patches, the raw surfaces thus produced adhering together, and thus producing cicatricial contractions.

Croupous and Diphtheritic Vaginitis.

Definition.—A form of vaginitis characterized by the formation of false membrane.

Occurrence.—It is observed chiefly in the puerperal state, and with the acute infectious diseases, especially measles, smallpox, typhus, and cholera, and under these circumstances occurring without known cause; or excited by irritating discharges from carcinoma, ulcerating fibroids, and polypi, fistulæ, ulcers, or pessaries left in for too long a time.

Symptoms.—Like those of a very severe form of acute vaginitis, except that the constitutional symptoms, especially the prostration, are very severe.

Physical Signs.—We find patches of false membrane covering the vagina in spots or entirely, and giving rise to ulcerations when detached, accompanied by a very offensive sanguino-purulent discharge.

Prognosis and Treatment will depend upon whether it is a complication of some constitutional disorder or purely local; when the latter, removal of the source of irritation, and treatment as in acute simple vaginitis, with the additional use of greased tampons to keep the ulcerated surfaces from adhering, will usually effect a speedy cure.

Where it complicates the puerperal state or the acute infectious diseases, the treatment of the primary disorder, and cleanliness to the local inflammation, is all that can be done.

Leucorrhœa.

Definition.—A mucous, mucopurulent, or purulent discharge of a whitish, yellowish, or greenish color escaping from the female genitals. It is exceedingly common.

Etiology.—It is a symptom only, and depends upon some temporary or permanent abnormal condition of the female generative tract.

It may be due to:

(*a*) *Physiological causes* (Hyperæmia):

Pregnancy.

Parturition.

Before and after the menses.

At puberty instead of menses.

Excessive coition.

(*b*) *Constitutional causes:*

Anæmia.

Chlorosis.
Scrofula.
Tuberculosis.
Malaria.
Rheumatism.
Gout.
General debility.
(*c*) *Venous congestion:*
Cardiac disease.
Aneurism.
Hepatic disease.
Emphysema of the lungs.
Pelvic peritonitis.
Pelvic cellulitis.
Any pelvic or abdominal tumor pressing upon veins.
Constipation.
Uterine displacements.
Chill.
(*d*) *Structural changes in*
Vulva.
Vagina.
Uterus.
Fallopian tubes.

VARIETIES.—(1) *Vulvar.*—Glairy and viscid, mucous or mucopurulent; consists of mucus, varying amount of pus, and epithelial cells.

(2) *Vulvo-vaginal.*—Rare; usually thick and creamy; consists almost exclusively of pus cells.

(3) *Vaginal.*—Mucopurulent or purulent, white or yellow, acid reaction; consists of an acid fluid in which are suspended vaginal epithelium, pus cells, fatty and granular matter, and varying quantity (usually small) of red blood-cells.

(4) *Cervical.*—Thick, transparent, tenacious, and al-

kaline; consists of a thick alkaline magma, entangled in which are columnar epithelial cells (usually deprived of cilia), mucous corpuscles, pus cells, varying quantity of red blood cells, and granular and fatty matter.

(5) *Intra-uterine.*—Transparent, like white of egg, thinner than cervical, often rendered turbid by admixture with pus, and not infrequently tinged with blood; consists of an alkaline fluid, in which are suspended ciliated and non-ciliated cylindrical cells, and varying quantities of pus and red blood globules, granular and fatty matter.

(6) *Tubal.*—Nature obscure; probably like that of intra-uterine.

TREATMENT.—*Removal* of the *cause* constitutes the most important part of the treatment; when this is removed the leucorrhœa subsides.

We must, however, also treat the symptom, which is at least an annoying one.

When due to physiological cause, no treatment is of course indicated, excepting ablutions for the sake of cleanliness.

When due to constitutional causes, endeavor to remove these by their proper agents.

For visceral disorders, acting by causing venous congestion, we can often, by proper remedies, alleviate, if not cure, these affections.

For the symptom itself, relief, if not cure, may often be obtained by the use of injections of hot water or solutions of astringents, such as alum, acetate of lead, sulphate or sulphocarbolate of zinc, borax, boric acid, carbolic acid, corrosive sublimate, nitrate of silver, or infusions of oak-bark, matico, and other tannin-containing barks, etc.; also tampons of cotton soaked in glycerin.

This applies chiefly to the vulvar and vaginal varieties; cervical and uterine leucorrhœa demand direct applications for their cure, though irrigation is useful by washing away the discharges, and thus keeping the parts clean.

Fistulæ of the Female Generative Organs.

Definition.—Abnormal passages extending between different parts of the female genito-urinary organs, or between these and adjacent viscera, due to traumatic or morbid influences.

Varieties.—1. *Urino-genital.*
Vesico-vaginal.
Urethro-vaginal.
Vesico-utero-vaginal.
Vesico-uterine.
Uretero-uterine.
Uretero-vaginal.
2. *Fecal.*
Recto-vaginal.
Entero-vaginal.
Recto-labial.
3. *Simple Vaginal.*
Peritoneo-vaginal.
Perineo-vaginal.
Blind vaginal.

Urino-genital Fistulæ.

Etiology.—(*a*) Congenital.
(*b*) Acquired.—Prolonged or severe pressure.
Direct traumatism.
Abscess and ulceration.

Non-closure of vesico-vaginal fistula intentionally resorted to for cure of cystitis.

Prolonged or severe pressure is the most frequent cause, and the most frequent examples occur during parturition, and are due to occupation of the pelvis for a long time by child's head, or to violent pressure upon some part of vagina against the pelvic wall; in either of these cases the fistula results from a circumscribed sloughing; this will take place and the fistula be established within a few days after delivery—rarely as late as two or even four weeks after delivery. The predisposing causes are narrow pelvis, large head of child, and face presentations.

Rarely pressure from pessaries, or from stone in the bladder or fecal accumulations during labor may cause this affection.

Under the head of direct traumatism come lacerated wounds of the vaginal walls by the use of forceps or other instruments during labor, usually occurring in cases in which labor has already been protracted.

Ulceration may be due to puerperal vaginitis, cancer, syphilis, phagedæna, diphtheria, and vaginitis occurring during the exanthemata.

Symptoms.—Escape of urine from an opening other than the urethra; a very small part or all the urine secreted may be voided through the fistulous opening, depending upon its seat and size.

Constant dribbling of urine, which acts as a local irritant and excites pruritus, excoriations, and eruptions of vulva and inner side of thighs; these parts being constantly wet with the discharge, an offensive uriniferous odor emanates from the body.

Impairment of health due to local annoyance.

Menstruation often in abeyance.

Physical Signs.—Ascertained by touch alone, if a large opening: if small, use Sims's speculum and position, or, better, knee-chest position; injection of the bladder with water, or, better, with milk, or water colored with cochineal, permanganate of potash, madder, or indigo, and watching where this escapes, will often detect a very small one; then the use of a probe will show the course, extent, and termination of fistula.

Complications.—Vaginitis; vulvitis; eruptions, excoriations, and pruritus of vulva and inner sides of thighs; stricture of urethra and vagina; endometritis; perimetric inflammations.

Prognosis.—Very rarely do they undergo spontaneous cure. The chances of complete and permanent cure are very good, if operated upon; the only unfavorable cases are those in which, on account of position, surgical measures are impossible.

Treatment.—This may be subdivided as follows:

(*a*) Natural cure soon after occurrence during delivery.

(*b*) Cauterization.

(*c*) Suture.

(*d*) Elytroplasty.

(*e*) Closure of vagina.

Natural Cure.—When the existence of a urinary fistula becomes apparent a few days after delivery, a Sims's catheter should be placed in the bladder, frequent vaginal irrigations with carbolized water be resorted to, and the woman kept lying on the abdomen, in order that repair of the fistulous opening may possibly take place. Most cases do not terminate thus favorably, and a permanent fistula is established. But no further operative proceedings are warranted at this

time; it is better to wait until the immediate effects of parturition have been recovered from.

Cauterization of the edges of the fistula by nitrate of silver or the actual cautery is rarely if ever now employed; if used, it is certainly applicable only to the very smallest openings. The edges are cauterized, and after the sloughs separate this may be repeated; the bladder is supported in the meanwhile by vaginal tampons or a glass plug, and the urine prevented from passing out through the fistula by using a stationary catheter.

Elytroplasty is a very difficult operation, and one which is now very rarely resorted to; it may possibly be employed where there has been a great deal of loss of tissue. It consists in taking a flap from one buttock or from the posterior vaginal wall, and fixing it by sutures into the fistulous opening, the borders of which have been pared beforehand.

Closure of vagina is resorted to when all other means fail. When, on account of very great loss of substance, or any other reason, the fistula cannot be closed, this procedure is justifiable; it makes the bladder and vagina the common receptacle for urine and menstrual discharge, and allows these to be voided at will; thus preventing the constant and annoying dribbling through the fistula.

This step may be accomplished in two ways:

(1) *Episiorrhaphy.*—The union by sutures of the pared inner surfaces of the labia majora; this is simple but imperfect, since a small opening frequently remains just below the meatus, from which urine escapes.

(2) "*Kolpokleisis.*"—Simon's operation of obliterating the vagina, by paring its surface just below the fistulous opening, and uniting the freshened walls by

sutures. This operation fulfils its purpose, and when closure of the vagina is desirable, is a reliable one.

Sutures.—The preceding methods of operation have been described, because they may be of service in the very few cases in which the method we are now about to discuss is impracticable. In the vast majority of cases, however, the operation by sutures is *the* operation for urinary fistulæ.

This method of operation was first rendered practicable by J. Marion Sims, who, together with Simon, then advanced and perfected it. There are two recognized plans of operation, Sims's and Simon's; Sims's is usually considered much preferable, excepting when great loss of tissue at the base of the bladder has occurred in very obese subjects.

Sims's Operation.—*Preparation of Patient (in both Sims's and Simon's Operations.)*—The woman should be in good health at the time of the operation. Should she apply for treatment in the opposite condition, open-air exercise, change of air, nutritious diet and tonics should be resorted to for several weeks; during this time any surrounding local inflammation, such as endocervicitis, vaginitis, etc., should be treated, and the vagina washed out twice daily, to insure cleanliness. Any complicating cicatricial bands should be severed, and their recontraction prevented by the insertion of a glass plug. Any urethral stricture should be dilated. Previous to operating, the bowels should be thoroughly emptied, and no solid food taken on the day of operation, both to avoid vomiting and choking during anæsthesia, and vomiting afterward, which might tear out the sutures.

Requirements.—Four assistants, for anæsthesia, holding speculum, sponging, and handing instruments;

Sims's speculum; several tenacula; long-tooth forceps; several artery forceps; blunt hooks; straight and bent long-handled bistouries; long-handled scissors, straight and bent; short curved needles; needle-holder; fulcrum; wiretwister; silver wire; gut of silkworm; catgut, and silk; sponges and sponge-holders; hot water; vaginal irrigator.

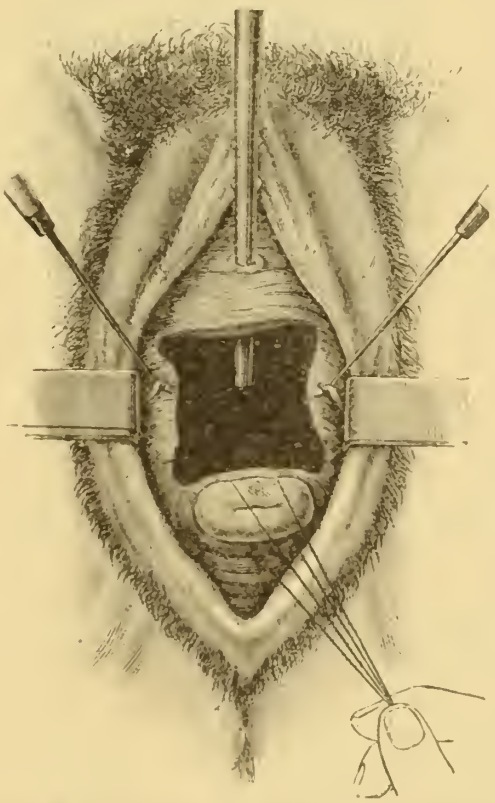
Operation.—The woman being anæsthetized and placed in Sims's position, the fistula is exposed by the aid of a tenaculum or forceps; a strip is cut from its margins with scissors or bistoury, bevelled from the vesical border outward, for about one-third of an inch, the mucous membrane of the bladder being left intact. Wire sutures are now passed by curved needles in needle-holders, or hollow needles on handles; if the former are used, silk is often passed first, and then the silver suture attached and drawn through. The point of entrance being half an inch from the edge, the needle is brought out at the vesical margin, then inserted at a corresponding point opposite at the vesical margin, and brought half an inch from the vaginal border by the aid of the blunt hook. The sutures are put in one-sixth of an inch from each other, a number being used sufficient to close the opening; they are now twisted upon the fulcrum by the wiretwister, not too tightly so as to strangulate, and cut off half an inch long, and pressed flat, so as to do no damage. The sutures may also be tightened by perforated shot, or upon Bozeman's plate.

After-treatment.—The bladder being washed out, opium is administered to constipate, the woman is kept quiet in bed, on nutritious but simple diet, and a stationary catheter—either Sims's sigmoid or his bulbous extremity catheter—left in the bladder, so as

to drain off the urine as it accumulates; the vagina is washed out daily. The sutures are removed in about ten days. The chief complications after the operation are hemorrhage into the bladder and cystitis.

Simon's Operation.—The chief differences between this and Sims's are the following: An exaggerated lithotomy position, with the thighs bent backward toward the abdomen; the use of speculum and side

FIG. 20.

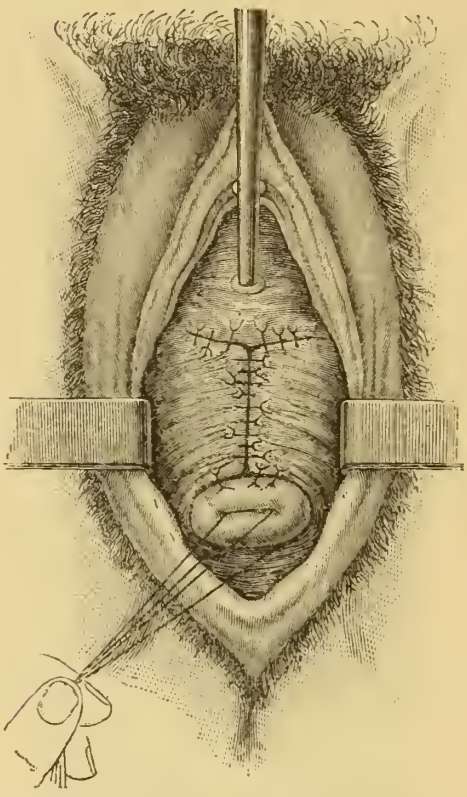


Simon's operation for vesico-vaginal fistula.

retractors; the vesical mucous membrane is included in the incision in some cases; the edges are brought together by one or two rows of fine silk; the patient is allowed to pass urine spontaneously; stitches are removed on the fourth, fifth, and following days; no particular restraint is put upon woman as regards

position, and she is allowed to get up at the end of a week; the bowels are kept loose instead of constipated.

Fig. 21.



Simon's operation—sutures in position.

Besides these two forms of operation, there are any number of modifications. Bozeman, for instance, places woman in knee-chest position, and has devised special instruments for the operation. He has obtained very excellent results. He begins the treatment with the use of hard and soft vaginal dilators, the soft ones being made of sponges covered with oil silk; the bladder is irrigated frequently; the gut of the silkworm is used for suturing; in the after-treatment he insists upon absolute rest in the recumbent position, the bladder being emptied every four or five hours, or the catheter left in the bladder.

The preceding description applies chiefly to the vesico-vaginal variety of fistula; the other forms of urino-genital fistulæ are rare, and often require special treatment, the details of which would be outside the scope of this work.

Fecal Fistulæ.

Definition.—These consist of communications between the vulva and vagina on the one hand, and the rectum or small intestine on the other. They are met with very infrequently.

Etiology.—They are produced by the same causes as produce urinary fistulæ, but are more frequently the result of abscess and ulceration than are the latter; stricture of the rectum is sometimes a cause.

Varieties.—(1) Recto-vaginal (most common).

(2) Recto-labial.

(3) Entero-vaginal (very rare).

Symptoms and physical signs are the same as in urinary fistulæ, excepting that feces are substituted for urine in the discharges; and, hence, the condition is still more annoying.

Treatment.—They rarely heal spontaneously. The operation for their cure is like that for vesico-vaginal fistula, the special points being these: Be careful to clear out the rectum thoroughly before operation; lithotomy position; sphincter ani is stretched; after the operation, a rectal tube is inserted and retained, and the bowels kept constipated for ten days, after which laxatives are employed.

The entero-vaginal variety does not usually admit of surgical interference.

Simple Vaginal Fistulæ.

These are fistulous communications between the vagina and certain surrounding parts, such as the perineum or the peritoneum; or else they are blind pouches extending from the vagina in various directions, and usually the result of previous abscess or cellulitis.

The perineal fistula may be the result of injury during parturition, traumatism, or the partial closure of a lacerated perineum. They are treated like other fistulæ.

The peritoneal fistula is very rare, gives rise to no especial annoyance, and calls for no treatment; there is, however, always the danger of hernia.

Vaginal sinuses are treated by dilatation, and irritation, and cauterization of the wall of the fistulous tract.

Foreign Bodies in the Vagina.

Occurrence:

1. For purposes of masturbation; *e. g*, hair pins, darning needles, needle boxes, pencils, etc.

2. To prevent conception; *e. g.*, tampons, sponges, etc.

3. As a hiding place; *e. g.*, jewels, money, etc.

4. Pieces of instruments introduced by physicians or nurses, which have been broken off and left in vagina; *e. g.*, pieces of speculum, nozzles of syringes, pessaries.

5. In cases in which tumors rupture into the vagina, such as dermoid cysts (hair and teeth), or extra-uterine fœtation (bones of the fœtus), or ecchinococci, urine or feces in case a communication exists with bladder or rectum.

6. Through a fall, a piece of wood or iron may enter the vagina.

Symptoms.—These different varieties of foreign bodies often produce marked symptoms and rapid ulceration; they are sometimes removed with great difficulty, owing to the fact that through contraction of the walls of the vagina they are held very tightly and are often drawn higher up.

CHAPTER V.

AFFECTIONS OF THE UTERUS.

Anatomy of the uterus—Malformations of the uterus—Atresia of the female genital tract and its results—Displacements of the uterus—Ascent—Descent or prolapse—Anteflexion—Anteversion—Retroflexion—Retroversion—Lateral displacements—Hernia of the uterus—Inversion of the uterus.

Anatomy of the Uterus.

The uterus or womb is a hollow muscular organ, which is the source of the menstrual discharge, receives the ovum, and nourishes and expels the fœtus.

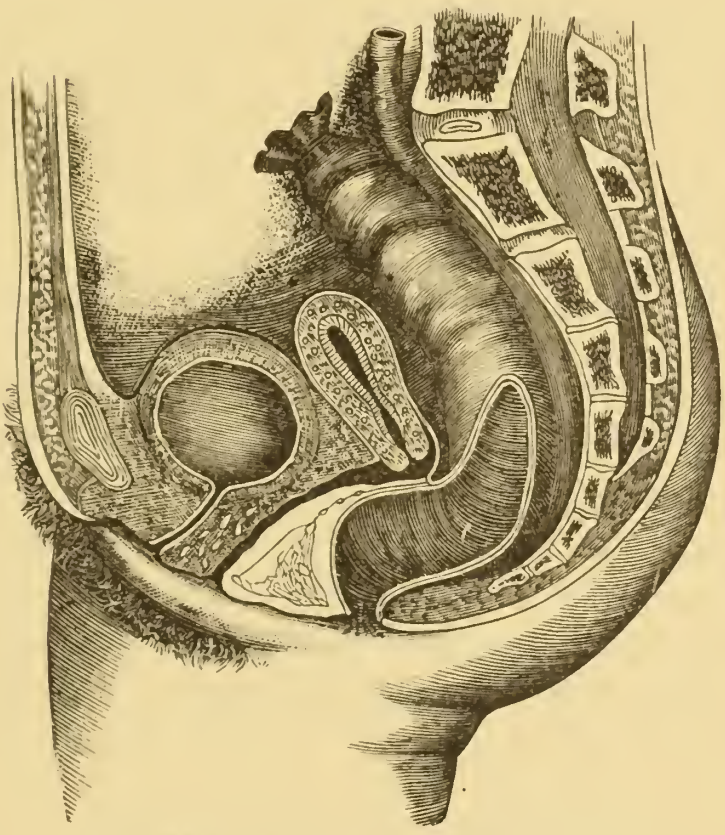
It is situated in the centre of the pelvic cavity, its fundus about on a level with the brim, about in the position of the axis of the superior strait, but often changing; it is in relation in front with the bladder, behind with the rectum, superiorly with the small intestine, below with the vagina and perineum, and laterally with the broad ligaments, and ovaries, and tubes. (Fig. 22.)

Its form is somewhat that of a pear, a little flattened from before backward, more rounded posteriorly than anteriorly; its dimensions are two and a half to three inches in length, one and a half to two inches in width at its widest part (fundus), and one inch in thickness at its thickest part (about middle).

Anatomically, it may be divided into (1) fundus, that part situated above the line of entrance of the Fallopian tubes; (2) body, the part between fundus and

cervix; and (3) cervix, the lower half between the external and internal os. The cavity of the body of the virgin uterus is a triangular slit of about ten to twelve drops capacity; that of the cervix is spindle-shaped,

Fig. 22.



Normal position of the uterus.

being widest at the middle and constricted at the internal and external os; the external os presents in the virgin a small transverse slit, bounded by an anterior and a posterior lip.

The layers of the uterus are:

(1) *External Coat.*—An investment of the peritoneum; this covers its fundus, its anterior surface down to the level of the internal os, whence it is reflected on to the bladder, the whole posterior surface along which

it is continued on to the upper fifth of the posterior vaginal wall, and then is reflected on to the rectum, forming the pouch of Douglas.

(2) *Middle Layer.*—Composed of unstriped muscular fibres, and a small amount of connective tissue, arranged longitudinally, circularly, and obliquely, and blended together so as to form a network; in the cervix they are circularly disposed.

(3) *Internal Coat.*—Mucous membrane—which is thin, pink in color in body, gray in cervix; it is connected very closely with the muscular layer, being peculiar in the absence of submucous connective tissue. It presents the openings above of the Fallopian tubes, and below of the external and the internal os of the cervix, and all along its surface of the utricular glands; these are minute tubular, straight, twisted, tortuous, and branched follicles, terminating at the mucous surface in open mouths, their opposite closed extremities being embedded in the muscular substance of the uterus; they secrete an alkaline mucus, and are lined by columnar epithelium, and between them are found connective tissue, arteries, veins, lymphatics, and nerves.

The epithelium covering of the mucous membrane of the uterus is columnar ciliated (with the cilia waving upward) except at the lower intra-vaginal portion of the os externum, where squamous epithelium, covering in vascular papillæ, is found.

The mucous membrane of the cervix is arranged in the form of longitudinal stems, from which lateral branches pass off, and this appearance has given rise to the term "arbor vitæ;" embedded in its mucous membrane are racemose glands which secrete an alka-

line mucus, and many of which become distended, and then constitute the ovules of Naboth.

Blood Supply of the Uterus.—(*a*) *Arterial*—from uterine and ovarian arteries; these send in branches on the side of the uterus, which plunge into its substance, and then anastomose and form a dense network; the smaller ones are very much twisted, and are known as the "curling arteries." A branch of some size is situated at the junction of the body and cervix, uniting the ovarian arteries of the two sides.

(*b*) *Venous*, corresponds to arterial; the veins are without valves, form sinuses in the muscular tissue, and empty into and form with the vaginal veins the "pampiniform plexus."

Lymphatics are very abundant but small, and terminate in the pelvic and lumbar glands; they increase greatly in size during pregnancy.

Nerve Supply.—Chiefly sympathetic, from hypogastric, renal, ovarian, and aortic plexuses; the ultimate fibres pass to the nucleoli of the muscle fibres. There is thought to be a limited supply from the third and fourth sacral nerves also.

Ligaments of the Uterus.—The uterus is connected with surrounding parts by four pairs of ligaments:

(1) *Utero-vesical or Anterior.*—These are double folds of peritoneum containing muscular and fibrous tissue, vessels, nerves, and lymphatics, extending from the anterior surface of the uterus to the posterior surface of the bladder; they prevent too great malpositions of the uterus backward from the filling of the bladder.

(2) *Utero-sacral or Posterior.*—These consist of reflections of peritoneum containing muscular and fibrous tissue, vessels, nerves, and lymphatics, from the posterior wall of the uterus to the front and sides of the

third and fourth sacral vertebræ; they prevent too great malpositions of the uterus, from distention of the rectum and during coition.

(3) *Round.*—These are fibromuscular cords passing from superior angles of the uterus outward, forward, and then inward, through the internal abdominal ring and inguinal canal; they are four and one-half inches long, and are lost in the labia majora and mons veneris; they serve to keep the uterus from being pushed up during coition.

(4) *Broad.*—These consist of folds of peritoneum containing muscular and fibrous tissue, vessels, nerves, and lymphatics, enclosing the uterus in its laminæ, and tending to support it and keep it in place. It divides the pelvis into two compartments, an anterior containing the bladder, and a posterior containing the rectum. It divides into three folds, in the anterior of which is the round ligament, in the middle the Fallopian tube, and in the posterior the ovary and fimbriated extremity of the Fallopian tube; it is inserted into the sides of the pelvis.

We find the following differences between the

Nulliparous Uterus and the *Multiparous Uterus.*

Anterior and posterior surfaces more flat.	More rounded.
Fundus nearly flat.	Fundus convex.
Cervix short, hard, and cartilaginous.	Cervix elongated and softer.
External os transverse; orifice smooth and small.	External os round; orifice larger and puckered.
Weight 1 to 1½ ounces.	Heavier.
Size smaller.	Diameters all increased.
Cavity of body triangular and small; holds twelve drops.	Cavity of body oval and enlarged.
Internal os closed.	Internal os open.

The Affections of the Uterus.

These may be divided into:

1. Malformations.
2. Atresia and stenosis of cervical canal and uterus.
3. Displacements.
4. Tumors.
5. Inflammations.
6. Atrophy and hypertrophy.
7. Lacerations of the cervix.

Malformations of the Uterus.

Embryonal Development of the Female Generative Organs.—At the fifth week of fœtal life there lies on each side of the vertebral column the Wolffian body, composed of a large number of tubes closed at one end, and opening by the other into a common efferent duct—Gärtner's canal—which leads to the bladder. At about the middle of the Wolffian body lies the germinal gland, which afterward becomes the ovary (testicle in the male). From the anterior part of the Wolffian body springs Müller's duct, on each side; the latter gradually approach each other and coalesce, their lower part forming the vagina and uterus; the upper parts remaining separate, form the Fallopian tubes.

Uterine malformations are produced:

a. When Müller's ducts fail to unite.

b. When Müller's ducts unite, but the septum between them does not disappear.

c. When one of Müller's ducts is absent or only imperfectly developed.

d. When both of Müller's ducts are rudimentary at corresponding parts on the two sides.

e. When one or both Müller's ducts are excessively developed.

Varieties.—The uterine malformations met with are:

1. *Complete absence of uterus*, due to failure of development of Müller's ducts; very often in these cases the ovaries are also absent, or all the generative organs may be absent; it is exceedingly rare.

2. *Rudimentary uterus*, with or without a cavity, often accompanied by a like condition of other parts of the sexual apparatus.

3. *Rudimentary condition of all parts excepting ovaries.*

4. *Bicorn uterus*, when Müller's ducts have failed to unite, and thus the uterus has two horns, the development of one or the other usually preponderating.

5. *Unicorn uterus*, when one of Müller's ducts has been entirely or almost entirely absent; rudimentary cornus often exists besides the perfect one.

6. *Double uterus*, where the septum has not disappeared; this is often associated with double vagina.

7. *Divided uterus*, where the septum has not disappeared in the upper half of the uterus.

8. *Congenitally misplaced uterus*, where the organ does not occupy its normal axis.

9. *Infantile uterus*, where the organ is normal at birth, but does not develop after this period; this is usually accompanied by a like condition of the other organs of generation. Such a uterus is characterized by shortness of the body and great comparative length of the cervix—a condition which is normal at birth.

10. *Congenital atrophy*, when the uterus is of the normal adult type, but atrophied as a whole.

The symptoms of these malformations are due to impairment of function, and, hence, only show them-

selves after puberty; they will be considered together with treatment in those few cases in which the latter is indicated, under atresia (vide p. 115), and amenorrhœa.

Atresia of the Female Genital Tract and its Results.

Definition.—Complete occlusion of some part of the genital tract.

Situation.—It may occur at the hymen, labia, vagina, or cervix uteri.

Occurrence.—It is not usually discovered until after puberty, and then only in seeking a cause for the non-appearance of the menses. Its chief interest and importance arise from its preventing the escape of the menstrual secretion, and the results following the distention of the parts above the occlusion.

Etiology.—(1) *Atresia of Labia and of the Hymen.*

Atresia of the labia may be (*a*) congenital, or

(*b*) The result of:

Chemical agents locally applied.

Burns and scalds.

Traumatism.

Gangrenous vulvitis.

Diphtheritic vulvitis.

Syphilitic and other ulcerations.

(2) *Atresia of the vagina* may be:

(*a*) Congenital. (1) No trace of the canal may exist.

(2) A fibrous cord may mark the usual site.

(3) A small cul-de-sac may exist below and obliteration above.

(4) It may be obliterated below to a variable extent and have a cul-de-sac above this.

(5) A cul-de-sac below is separated from one above by a dense partition (higher up than the hymen).

(*b*) Acquired—due to arrested development.
Injuries during parturition.
Other injuries.
Local chemical agents.
Syphilitic and other ulcerations.
Burns and scalds.
Vaginitis accompanied by sloughing in exanthemata, typhoid and typhus fevers.

(3) *Atresia of Cervix Uteri*—this is rather rare. It may be congenital or acquired, and in either case may be situated at external os, internal os, or involve the entire cervical canal.

(*a*) Congenital.
(*b*) Acquired, due to endometritis.
Sloughing after parturition.
Use of caustics.
Use of curette.
Amputation of cervix.
Cicatrization following ulceration, granulation, or laceration of the cervix.
Cancerous and fibroid tumors of cervix.
Senile atrophy.

Symptoms and Results.—(*a*) *Vulvar and Vaginal Atresia.*—Before puberty there are none, and after the menopause there may be none. Soon after puberty the absence of the menstrual discharge will be noticed, and on physical examination the condition will be at once observed. Should menstruation have gone on many months, the genital tract above the atresia will have become distended with the retained secretion, and a tumor be produced; the vagina is at first distended and hypertrophied, and then as more fluid accumulates, the uterus, and finally the Fallopian tubes, become distended.

As a result of such distention we commonly have:

Absence of menstrual discharge.

Pain, especially at the menstrual periods.

Vomiting.

Constitutional symptoms due to septic poisoning from retained secretion.

Interference with micturition and defecation, by pressure upon bladder and rectum.

Tumor.

May have pelvic peritonitis and cellulitis.

And, finally, also rupture of vagina, or uterus, or tubes, pelvic hæmatocele, and even shock and death.

(*b*) *Cervical Atresia.*—Before puberty there are usually no symptoms; after menopause this may also be the case, but exceptionally hydrometra, due to the secretion of a watery fluid, takes place, and this may even suppurate.

Between puberty and menopause the cervical atresia usually results in distention of the uterus, and then the tubes with menstrual secretion, or rarely with serous fluid; the results of such distention are the same as those already given above under vaginal atresia.

Differential Diagnosis.—A tumor due to retained menstrual secretion must be differentiated from

Uterine fibroids.

Malignant growths.

Ovarian tumors.

Hæmatocele.

Pregnancy.

The suppression of the menses, the tumor being uterine, its slow growth and increase at each menstrual epoch; and, finally, the readily discovered occlusion by finger or probe, will serve to differentiate. Palpation

must be done with care, so as not to rupture a thin-walled distended tube.

A double uterus may present atresia of one side and a normal condition of the other.

The diagnosis is rendered certain by the use of a small aspirator, with strict antiseptic precautions; a thick, dark-red or tarry mass is diagnostic of this condition.

Prognosis depends upon the seat of the atresia, the extent and completeness of obliteration, and the amount of distention produced. The higher up the atresia, the worse the prognosis; the most favorable cases are those in which the occlusion is at the labia or hymen; occasionally these rupture spontaneously, or as a result of attempts at coition. The most serious cases are those in which the atresia is at the cervix. Occasionally, as a result of deterioration of health, amenorrhœa occurs, and then the fluid portions of the tumor may be absorbed and the rest form a very small, innocent mass, and thus, rarely, spontaneous cure may result; ordinarily, however, no such favorable termination can be expected.

Cases in which there is complete absence of vagina and uterus cannot be benefited except by extirpation of the ovaries, should these exist and perform their function (fortunately in these cases they are usually absent). An artificial vagina can be created when the uterus and ovaries exist. After a successful operation, death may still result from septicæmia, salpingitis, and peritonitis; always, when the atresia is above the hymen, the prognosis is serious and doubtful when an operation is attempted, but much worse yet if no interference is resorted to.

Treatment.—Consists in opening up or forming a new channel for the escape of the menstrual secretion.

In all these operations, where there has been previous distention, the following *dangers* must be remembered:

(*a*) Too hasty evacuation of the accumulated fluid may cause *rupture of the Fallopian tubes;* these have previously been distended, their walls thinned, and bound down to the pelvic walls by adhesions; when the contents of the uterus are evacuated rapidly, this organ collapses and thus no longer gives the tubes their former support; this may cause rupture and hemorrhage, or peritonitis.

(*b*) *Septicæmia.*

(*c*) *Contraction* of the new canal, which may lead to *reobliteration.*

1. *For Atresia of Cervix Uteri.*—The accumulation in the uterus is first drawn off with an aspirator at one sitting if small in amount, or in three or four sittings separated by intervals of a week, if the distention be great; in the latter case, a part only is removed each time, since to remove all might cause uterine contractions and these rupture the Fallopian tube; it is done under strict antiseptic precautions, and in the intervals of puncture the vagina should be kept tamponed with carbolized cotton for two days after each puncture. If, during this gradual evacuation, septic symptoms present themselves, the whole should be removed at once, and the cavity washed out.

Having withdrawn the menstrual blood, the obstruction can often be overcome by the forcible passage of a sound, but a knife may be required, in which case Thomas employs the following plan: The cervix being steadied by a tenaculum, an exploring needle is pushed into the cavity of the uterus through the line of the

cervical canal; the cervix is then excised from this point in four directions by means of a delicate tenotome passed along the groove of this exploring needle; the uterus is then washed out, a glass plug inserted into the cervical canal to keep it open, and the vagina tamponed.

2. *For Atresia of Vulva.*—This can usually be overcome by slight force of the fingers or torn with the nail, the adhesions usually being slight; or a small incision may be made and enlarged by tearing. The same precautions apply to this and all other forms of atresia, of gradually evacuating a greatly distended uterus, as have been detailed above.

3. *For Imperforate Hymen;* and, 4, *For Partition Atresia of Vagina.*—A small incision may be made and enlarged by tearing, or a free crucial incision resorted to, or a circular piece cut out. Simpson recommends that the opening be made with the cautery. Sims's glass vaginal plug should then be employed to keep it open.

5. *For Extensive or Entire Closure, or Absence of Vagina.*—Thomas gives the following indications for the performance of the operation for this variety of atresia: (*a*) "If menstrual blood be imprisoned; (*b*) if a uterus can be distinctly discovered and the patient be suffering from absence of menstruation; (*c*) if the necessity for sexual intercourse be imperative." When there is retained menstrual secretion, it is easier to operate than when no distention exists.

The most common operations are Dupuytren's and Amussat's, which differ in that the former is done at one and the latter at several sittings.

A small incision is made externally, and then the finger or some blunt instrument is worked up guided

by a sound in the bladder and a finger in the rectum, until the cervix is reached; the canal thus created is kept open by glass vaginal plugs and cleansed by irrigation daily.

Fletcher made a small incision and then by forcible passage of bougies made the opening. Electrolysis has been successfully used for this purpose.

Displacements of the Uterus.

Definition.—A deviation of the uterus from its normal position or curvature; by French writers, ascent and descent are termed displacements, versions and flexions being classified as deviations.

Varieties:

Ascent.
Descent.
Anteversion.
Anteflexion.
Retroversion.
Retroflexion.
Lateroversion.
Lateroflexion.
Combinations of lateral and ante or retroversions and flexions.
Inversion.
Hernia.

Relative Frequency of Different Varieties.—Reliable figures cannot be given, because statistics of different competent observers have shown great discrepancies. Flexions are probably more common than versions, and anteflexions more frequent than retroflexions.

Pathology.—Version is a change in the longitudinal

axis of the uterus; flexion is a bending of the uterus, so as to possess an unnatural curve.

Significance.—The significance of uterine displacements is variously estimated by different gynecologists.

One class believe that they produce no symptoms whatever when not complicated by other conditions, and that the complications and not the displacements are the cause of symptoms. Hence they say, pure uterine displacements call for no treatment.

Another class attach great importance to these displacements, contend that they constitute the cause of a large percentage of female complaints even when not complicated, and hence advise a correction of the deformity or displacement in every case.

A third class, probably the exponents of the true state of things, believe that, while uterine displacements may exist without producing symptoms, yet that in most cases they lead to further consequences, which soon assert their presence by well-marked disorders; and hence early treatment is advised.

Results and Complications.—Chiefly by interference with the uterine circulation, by flexion of the uterine canal, by exposure, and by friction.

Chronic endometritis.
Chronic metritis.
Fungoid, granular, and cystic degeneration of the endometrium.
Chronic uterine congestion.
Disorders of menstruation.
Sterility.
Tendency to abort.
Disease of ovaries and tubes.
Periuterine inflammations.
Cystitis, and many others.

Supports of the Uterus.—The normal form, position, and relations of the uterus have been described (vide p. 106).

Its supports are: 1. Supporting power of the abdominal walls.

2. Neighboring viscera.

3. Pelvic walls and intrapelvic areolar tissue.

4. Upper part of vagina.

5. Uterine ligaments.

Etiology.—1. *By Increasing Weight of Uterus.*—Congestion.

Chronic metritis.

Hypertrophy of uterus.

Pregnancy.

Subinvolution.

Uterine tumors; solid and cystic, benign and malignant.

2. *By Diminished Uterine Supports.*—Flabby abdomen.

Intestinal hernia.

Abnormally large pelvis.

Abnormal distention or weakening of abdominal walls.

Lacerated perineum.

Lack of tone of uterine ligaments.

3. *By Pressure.*—Tight clothing.

Tight lacing.

Pressure of heavy clothes upon abdomen for support.

Ascites.

Abdominal tumors.

Pelvic tumors.

Products of inflammation in neighborhood.

Habitually distended bladder.

Habitually distended rectum.

Muscular efforts.

4. *By Traction.*—Prolapse of vagina.

Prolapse of bladder.

Prolapse of rectum.

Adhesions, the result of perimetric inflammation.

Sloughing and consequent cicatricial contraction of the vagina.

Shortening of uterine ligaments.

5. *By interfering with the natural tone and resistance of the uterine walls* (operating chiefly in flexions):

Pregnancy.

Endometritis.

Acute and chronic metritis.

Subinvolution.

Tumors of uterus.

Distention of uterus.

Constitutional debility from anæmia, enfeebling diseases, overwork, bad hygiene, and other causes.

Symptoms.—Many of the symptoms are common to most displacements, but there are also some peculiar to individual forms of this affection.

Diagnosis.—This is made by vaginal touch, bimanual examination, and by the use of the sound.

Treatment.—The general principles of treatment are: 1. Recognize and remove, if possible, the cause.

2. Remove surrounding inflammations.

3. Attention to the general condition of the woman.

4. Replacement, or

5. Straightening of cervical canal.

6. Retention in the replaced and normal position.

Having completed the general consideration of this subject, the individual displacements will now be taken up, repetition of the facts just mentioned being avoided wherever possible, and only the peculiarities of each variety treated of.

Ascent of the Uterus.

Definition.—An abnormally high position of the uterus, never occurring as an original disease, but only symptomatic of some other condition.

Etiology.—1. *Increase in size of uterus, so as no longer to be retained in the pelvis:*

Pregnancy.

Tumors of uterus.

Hydrometra and hæmatometra.

2. *Tumor Within Pelvis Pushing Uterus Up:*

Atresia and distention of vagina.

Tumors of vagina and rectum.

Periuterine inflammations.

3. *Tumors or Inflammatory Products in the Abdomen, Drawing Uterus Up:*

Ovarian tumors.

General peritonitis.

Extra-uterine pregnancy.

Ascent of the uterus is merely a symptom of the conditions just enumerated, and hence requires no further consideration.

Descent or Prolapse of the Uterus.

Definition.—A changed position of the uterus so that the cervix approaches or protrudes from the ostium vaginæ.

Synonyms.—Prolapsus uteri: procidentia uteri (when complete or third stage); falling of womb.

Varieties.—It has been most simply divided into three degrees.

First Degree.—When somewhat sunk in pelvis, axis corresponding to plane of inlet.

Second Degree.—When os reaches ostium vaginæ, axis of uterus that of midplane of pelvis.

Third Degree.—When a part or whole of the uterus is outside of vagina, axis that of outlet of pelvis.

The first and second degrees are also known as simple *descent* or *incomplete prolapse;* the third degree as *procidentia* or *complete prolapse.*

Etiology.—The *direct cause* is a deficiency in one of the uterine supports already enumerated, and especially a relaxation of the utero-sacral ligaments.

The *predisposing causes* are parturition.

Frequent muscular exertion.

Senility.

Habitual constipation.

General feebleness.

The *exciting causes* are those given under the first four subdivisions in the paragraph on etiology in the general considerations: increased uterine weight, diminished supports; pressure out of place, and traction upon the uterus.

The most frequent combination of causes is seen after parturition, laceration of perineum and cervix, hypertrophy and subinvolution of uterus, and subinvolution and relaxation of the vagina and uterine ligaments.

It is more frequent in the old than in the young, probably on account of the atrophy of the vaginal walls and of the pelvic areola and adipose tissue in the former.

Though usually met with in multiparæ, and especially in those who have borne many children, it may occur infrequently in virgins and in nulliparous married women.

It is most often secondary to prolapse of the vagina.

Pathology.—The prolapsed uterus besides having changed its axis and position, soon becomes the seat of structural changes. It is at first congested and then truly hypertrophied, especially its lower part, or the seat of chronic metritis; its cavity becomes lengthened. Huguier speaks of hypertrophy of the supra-vaginal portion of the cervix being often mistaken for true prolapse, but this circumscribed hypertrophy is certainly rare.

There is eversion of the cervical mucous membrane which may be further changed by erosions due to friction, by endometritis, and by cystic and granular degeneration.

The vagina is everted and its cavity may be lost entirely; it becomes markedly hypertrophied, especially in its epithelial layer, and its rugæ become lost; being exposed to air and friction, its epithelial layer may become so thick as to resemble the skin.

There is usually prolapse of the anterior vaginal wall and cystocele, and prolapse of the posterior vaginal wall; the rectum may retain its normal position, or it may also descend; many other complications may exist.

The uterine appendages are dragged down with the uterus and the ligaments greatly stretched.

When this affection occurs suddenly, pelvic peritonitis or cellulitis may result.

Complications.—These are very frequent, both as concomitant and as secondary conditions. They are:

Congestion of the uterus and its appendages.

Chronic metritis.

Endometritis.

Eversion of the cervix.

Hypertrophy and elongation of the cervix.

Excoriations of the cervix.
Cystocele.
Cystitis.
Rectocele.
Diseases of the ovaries and tubes.
Peritonitis and cellulitis (in the acute form).

Symptoms.—We may distinguish two clinical forms:

1. Acute or suddenly acquired—very rare.
2. Gradual form—the usual variety.

In Acute Prolapse.—The uterus has usually been previously enlarged, but it may be of normal size. The displacement occurs as a result of sudden and severe muscular exertion, and is accompanied by severe pain, shock and its symptoms, and these are often followed by collapse or by peritonitis.

In the Usual Chronic Form.—The symptoms are due to changes which the uterus undergoes in its abnormal position and relations, interference with neighboring organs, and mechanical inconvenience. Though in rare cases no symptoms are present for a long time, yet usually one or more of the following are present:

Pain in back, loins, and pelvis, increased on exertion.
Tired and heavy feeling in pelvis.
Interference with micturition.
Rectal irritation.
Interference with locomotion.
Inability to muscular exertion.
Symptoms due to irritation and exposure to the air of the prolapsed organ, such as excoriations, leucorrhœa, etc.
Spontaneous reduction upon lying down.
Increased descent upon exertion.
There are usually no menstrual disorders, and

sterility does not seem to be very frequent in prolapsus.

Physical Signs.—Upon vaginal examination, the uterus is found in its abnormally low position, and lying in the axis of that part of the parturient canal to which it has descended. The degree of prolapse is rendered more apparent by examining the woman in the standing posture and causing her to bear down. When procidentia exists, the condition can be recognized at sight.

We also find the vaginal walls prolapsed, and complicating changes in the position and structure of the uterus. The length of the cervical canal is increased, much of this elongation being due to traction, and disappears upon replacement of the uterus.

Differential Diagnosis.—Must be made from:

Hypertrophy of the cervix, especially of the middle and upper portions.

Polypus of the uterus.

Inversion of the uterus.

Cystocele.

Rectocele.

These conditions are readily differentiated by noticing the relations of the extruded parts, and by the passage of the sound into the bladder and rectum.

Course and Prognosis.—It shows a tendency to become worse unless the causes are removed and the proper treatment employed. Should pregnancy occur, for coition is possible when the organ has been reduced, as the uterus increases in size, the prolapse is temporarily cured, and the impregnated organ remains in the pelvis; but after delivery and involution, it again becomes prolapsed, unless there has been a puerperal peritonitis, which binds it down in its proper

position; occasionally tumors of the uterus or in the abdomen cause a cure in the same way.

But usually the condition persists and becomes worse unless we interfere. In recent and slight cases, removal of the cause and retention by pessaries may cure; but in the more pronounced cases, and even in most of the recent cases, palliative proceedings do not cure, although they may remove annoying symptoms, and thus render the patient very comfortable. In nearly all cases cure can be effected by proper surgical proceedings.

TREATMENT. *Acute Cases.*—Reduction, rest in bed, opium to control pain, stimulants if necessary; if, after the acute symptoms have passed off, the condition remains, it should be treated as in the usual chronic cases.

Ordinary Chronic Cases.—The treatment of these can be divided into 1, treatment of certain complications; 2, replacement; and, 3, retention of the uterus.

1. *Treatment of certain complications* which are best treated when the organ is prolapsed, such as lacerated cervix.

2. *Replacement of Uterus.*—This can usually be done without any difficulty; it is aided by previously emptying the bladder and rectum. Should any difficulty be encountered, it should be effected in the knee-chest position, and firm pressure be made upon the cervix in the direction of the axis of the parturient canal in which the uterus lies; this pressure may have to be kept up for fifteen or twenty minutes, and then the uterus will usually have been replaced.

In exceptional cases, where a complicating tumor exists, replacement may be impossible, or, if gangrene have resulted, undesirable.

3. *Retention of the Uterus.*—Under this subdivision we discuss the removal of the cause of the prolapse and mechanical support by pessaries, and operations.

a. Removal of cause of prolapse (if possible or ascertainable).

(1) Remove increased uterine weight by treatment mentioned under chronic metritis. This also includes the removal of tumors, repair of lacerated cervix, and even the induction of involution of the uterus, by the stimulus derived from amputation of the cervix.

(2) Remove excessive abdominal pressure by supporting the skirts from the shoulders by suspenders or other contrivances; by a good-fitting abdominal supporter; prohibition of tight clothing and tight lacing; attention to the regular evacuation of the bladder and rectum; and the avoidance of prolonged or excessive muscular exertion.

(3) Improve the relaxed condition of the uterine supports by persistent employment of the recumbent posture, thus putting the uterine supports at rest, and allowing them to gain strength; by general tonics, such as iron, quinine, strychnine, the mineral acids, and the special uterine tonic ergot, by sea-bathing, change of air, exercise, etc.; by local tonic and astringent vaginal injections, such as cold water, sea-water, vegetable astringent infusions (oak bark, etc.), alum, tannin, astringent ferric compounds, etc.; special abdominal muscle-strengthening calisthenics; and finally supporting a relaxed perineum by a proper pad firmly held in position; and often combined with an abdominal supporter.

(4) The prevention of traction from below by colporrhaphy.

b. Mechanical support by pessaries, episiorrhaphy, perineorrhaphy, and colporrhaphy.

Pessaries are mechanical contrivances for supporting a prolapsed or displaced uterus and neighboring organs. They act by distending the vagina against the pelvic walls, and thus preventing its prolapse, by filling up the parturient canal below the prolapse, and by directly supporting the uterus. We can accordingly divide pessaries into two classes: the internal fulfilling the first two indications; and the other variety, the stem pessary, which directly upholds the uterus, and is connected in some way with external abdominal attachments. The two great requisites in applying pessaries are: proper selection and proper application; as a certain amount of skill is necessary for this, they succeed best in the hands of specialists. There are innumerable varieties of pessaries—good, bad, and indifferent—and in these pages no attempt will be made to describe all or even most of them, but only to mention a few of those most commonly employed.

Proper local preparation of the patient should precede the introduction of pessaries; this is accomplished by rest in the recumbent posture, regular evacuations of the rectum, strengthening and hardening the vagina by astringent injections, glycerin tampons, etc.

Internal pessaries may be used in slight cases, where the weight of the uterus has not been very much increased. The more commonly employed ones are Hodge's, Albert Smith's, Thomas's, Hewitt's, elastic ring, crossbar, Zwanke's (considered by many as a bad form), etc.

Stem pessaries are used in procidentia and in other degrees of prolapse when great weight is to be supported; the stem may be attached to a perineal band,

may curve forward over the abdomen, or backward over the perineum. Thomas recommends Cutter's stem pessary, which he modifies so that the stem is attached to the perineal band. In all cases, the stem is surmounted by a cap receiving the cervix, and is connected with an abdominal band. Stem pessaries should be removed every night, on retiring; the patient can reapply the instrument in the morning.

Internal pessaries require watching; they should not produce too great pressure; the patient should be instructed how to remove them herself when they cause pain; she should present herself for examination from time to time, when the instrument should be removed by the physician.

With the use of the pessary, the other forms of treatment above enumerated should be combined.

Should the woman be unable to wear a pessary for some reason, and not submit to an operation, the vagina may be packed with lint, so as to support the uterus; this must be changed once or twice a week.

Although the methods of treatment just described will not cure the prolapse, they will, in the great majority of cases, remove the annoying symptoms so effectively, and give such relief, that the patient is satisfied and wishes no further interference.

Should, however, the foregoing be insufficient, or a complete and permanent cure be desired, this can usually be achieved by

Operative Interference.—These operations are most useful in those cases in which the primary cause of the prolapse is traction from below.

a. Episiorrhaphy—an operation by which the vulvar fissure is narrowed. It consists of a denudation on either side, and approximation by sutures, leaving an

opening large enough for the egress of secretions, or, if desirable, for copulation. The operation is now seldom employed, for it often fails to secure more than temporary relief, the prolapse again taking place through the narrowed opening, or forming a sort of hernial protrusion at the perineum. The vulva has been closed by rings passed through its lips; Schröder says "Dommes combined beauty and utility when he united the labia by means of silver and golden rings."

b. Narrowing of vagina by cicatrization after sloughs produced by caustics, actual cautery, etc.; it is not now employed.

c. Perineorrhaphy—by removing the tendency of the vagina to prolapse. The operation has been described on page 69.

d. Colporrhaphy (described on page 78) often is advisable when the primary cause is prolapse of the vagina. Either the anterior or the posterior operation, or both, may be performed.

e. Combinations of colporrhaphy with episiorrhaphy or perineorrhaphy have been resorted to.

Anterior Displacements of the Uterus.

Anteflexion of the Uterus.

Definition.—An exaggeration of the normal curve of the uterus, by which the fundus, or the cervix, or both, are bent forward.

Occurrence.—It is a very common form of uterine displacement; but since a slight degree of anteflexion is considered physiological, the proportion of pathological cases is reduced. Anteflexion is physiological in childhood, and when existing to a slight degree in

the adult, does not constitute an abnormality. The fundus alone, or the cervix alone, or both together, may be bent forward to variable degrees; or, as sometimes happens if some anteversion coexists, the cervix may point backward, and the body still bent forward.

It is more common in nulliparæ, since it is so frequently the cause of sterility.

Etiology.—It may be congenital or acquired.

The acquired form due to

Anything causing increased uterine weight, such as chronic metritis, subinvolution, tumors, etc.

Pressure upon uterus from behind or above, or by cellulitis, etc.

Diminished support of the uterus by flabby abdomen, etc.

Dragging downward or forward of uterus by cystocele, etc.

These are the varieties of the causes, and can be elaborated by reference to the causes of uterine displacements in general (vide p. 121).

Symptoms.—These vary in severity.

In those cases in which the condition is merely a slight exaggeration of the physiological state, there are no symptoms.

More marked cases present symptoms which are due partly to the condition itself and partly to the secondary changes apt to follow in all displacements of the uterus.

The symptoms are: Dysmenorrhœa, due to obstruction at the point of flexion.

Sterility.

Dyspareunia.

Menorrhagia.

Frequent desire to urinate.

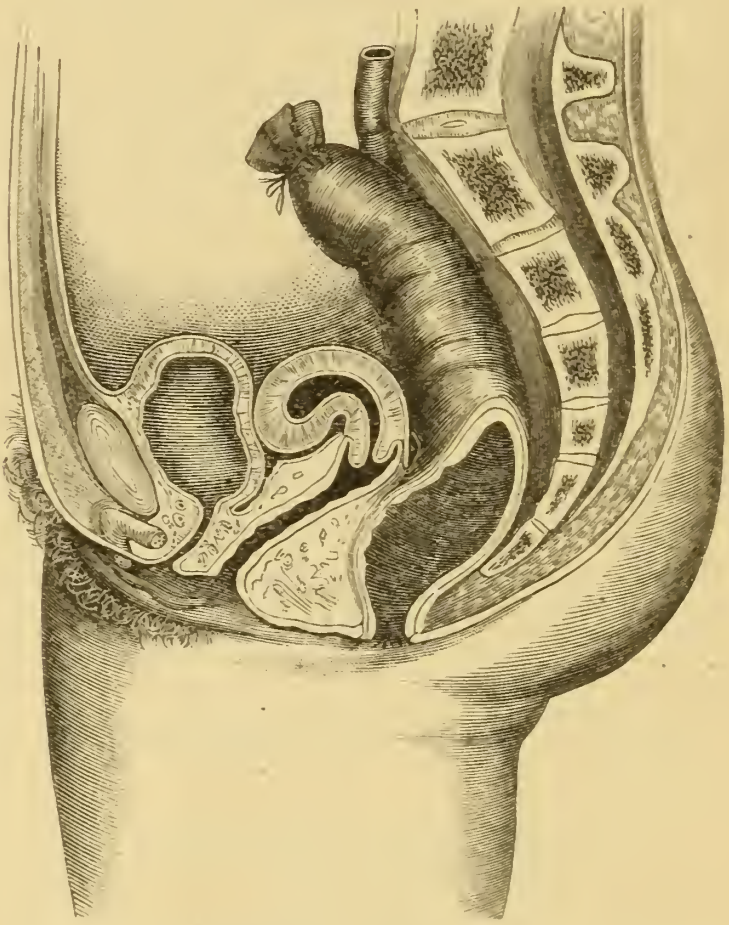
The usual concomitants of uterine disease:

Heavy feeling and pain in back, loins, and pelvis, especially on exertion.

Nervous and dyspeptic symptoms.

The symptoms may be further increased by those due to the numerous secondary or complicating conditions.

Fig. 23.



Anteflexion of the uterus.

Physical Signs.—By vaginal touch and combined manipulation, the fundus will be discovered lying in front of its usual position, immediately behind the bladder, and having a different axis than the cervix. In the congenital form the cervix is often found small and having a pinhole os. Should any difficulty in

diagnosis ensue, the use of the uterine sound or probe, the finger in the rectum, and the sound in the bladder will aid us (Fig. 23).

Differential Diagnosis.—The only conditions with which it might be confounded are tumors in the anterior wall of the uterus, and cellulitis anteriorly or posteriorly to the cervix. In both these cases the use of the sound will clear up any doubt, the only difficulty being in those cases in which a recent cellulitis contraindicates the use of the sound or even the probe.

Complications.—Those of uterine displacements in general.

Course and Prognosis.—Spontaneous cure never results; unless interfered with, the displacement continues and complicating conditions are apt to be added. The displacement itself does not endanger life, nor may it interfere with the general health very materially.

The prognosis as to cure is worse in the congenital variety, when the cervix is markedly flexed, when the cervix is short and high, and where from any cause, such as adhesions, cellulitis, etc., the flexion is irreducible.

Treatment.—1. *Removal of causes of displacement.*

a. When due to increased uterine weight, this should be remedied as far as possible by means already discussed.

b. Pressure upon the uterus from behind or above, such as from tight lacing, should be removed.

c. Uterine supports should be increased by abdominal pads and supporters, and other means.

d. Traction upon the uterus should be relieved by proper support to the parts exerting this force, by pessaries or operations.

2. *General Treatment.*—Suitable preparatory treatment—the use of pessaries and proper means to increase the tone of the general health and the strength of the abdominal walls, etc.; local tonics and astringents, calisthenics, general tonics, etc.; removal of any existing inflammations. These have already been described in speaking of prolapse.

3. *Reduction* is usually easy when the displacement is a reducible one. It may be accomplished in various ways.

(*a*) Bimanually. Two fingers of one hand are placed in the vagina and the fundus lifted, the other hand on the abdomen presses down between the body of the organ and the fundus, and then also lifts it; after the latter is lifted up and pushed backward, the cervix is to be pushed well forward toward the symphysis. Reduction is more easily accomplished during expiration, for then it has no pressure transmitted from the diaphragm to overcome. When there are adhesions, too much force must not be employed or mischief will result; the stretching of such adhesions by massage, accompanied by free vaginal irrigation, has been suggested, but as yet not sufficiently tried to warrant deductions. When reduction cannot be accomplished by the bimanual method, the following must be resorted to:

(*b*) Uterine sound. This instrument may be introduced up to the fundus as straight as possible, and being converted into a lever by the finger of one hand acting as a fulcrum at the centre of the sound, the outer end is carried forward to the symphysis, and thus retroversion of the uterus effected; then, by rotating the sound, a slight retroflexion results.

This, as well as the following proceedings, should

not be adopted in cases complicated by neighboring inflammations.

(*c*) Other varieties of sounds, so arranged that, after introduction they are straightened and thus effect a corresponding change in the uterine axis, may be used; Elliot's and Jennison's are examples.

(*d*) Tents, introduced curved and straightening themselves on expansion, are also used in the same manner.

In the preceding three methods, the proceeding is repeated a number of times, at intervals of several days or a week.

(*e*) Dilatation and straightening by steel sounds of gradually increasing diameters, is occasionally resorted to.

Though occasionally correction of the displacement is followed by cure, usually no such result takes place, and the reduced organ must be kept in the desired position by the following means:

4. *Retention.*—This is accomplished by the use of *pessaries.*

A good anteflexion pessary must lift the uterus supporting it as near the fundus as possible, and at the same time not cause injury by excessive pressure. They are of three varieties: the intravaginal, the vaginal stem, and the intrauterine stem; the precautions, preparatory and after-treatment, associated with the use of these pessaries, are the same as those already given.

Of the first two varieties, those most frequently employed are Thomas's, Hewitt's, Gehrung's, Fowler's Hodge's, Albert Smith's, Meigs's ring, and Cutter's stem passary.

An intrauterine stem pessary consists of a bulbous-pointed cylinder, two or two and a half inches long,

which is introduced into the uterine canal and straightens it; its escape being prevented by having it rest movably or immovably upon a vaginal anteversion pessary or a plate or ball. Thomas prefers an instrument in which the stem is movable upon the disk or pessary lying in the vagina. Schröder prefers one made of a single piece, the vaginal rest consisting of a ball; with this pessary, after correcting the flexion, any version may be remedied by moving the ball forward or backward, and keeping it so by balls of cotton.

The intrauterine stem pessary should only be used in cases in which the foregoing treatment has been found unsuccessful; great caution must be exercised in its use, especially in regard to the exclusion of existing inflammation, not having the stem too long so as to injure the fundus, and its immediate removal when any bad effects are observed; much mischief, such as cellulitis, peritonitis, hemorrhage, etc., has resulted from its use.

5. *Operation* is resorted to when all other treatment proves unsuccessful. The aim of the operation is not to cure the displacement, but to remove the resulting obstruction, and thus cure the most marked symptoms. There are two forms of operation: Simpson's and Sims's.

Simpson's: The cervix is divided bilaterally, and the enlarged and more direct opening kept pervious by the glass plug.

The operation of Sims is usually preferred; it consists in section of the cervix posteriorly, by a long slender knife, as deeply as possible without wounding the vagina; the canal thus created is kept pervious by

the wearing of an intrauterine stem and pessary for two or three months.

Many cases of these operations have been followed by dangerous and fatal results—these can usually be traced to the existence of inflammation at the time of operation, and hence the operation found to have been unjustifiable.

Anteversion of the Uterus.

Definition.—An inclination of the uterus, so that the fundus falls forward and the cervix backward. It is an exaggeration of the normal anterior version, occurs physiologically in early pregnancy, and is often combined with anteflexion.

Etiology.—Similar to that of anteflexion. It is especially due to chronic metritis and its causes, subinvolution, uterine fibroids, and periuterine inflammations.

Symptoms.—Very often there are none. Even when symptoms show themselves, they are, in great measure, some authorities say entirely, due to the complicating metritis or pelvic inflammation so often coexisting.

The symptoms which may be observed as a result of the anteversion itself, are: Vesical irritability (the most frequent symptom).

Rectal irritability.

Dysmenorrhœa.

Sterility.

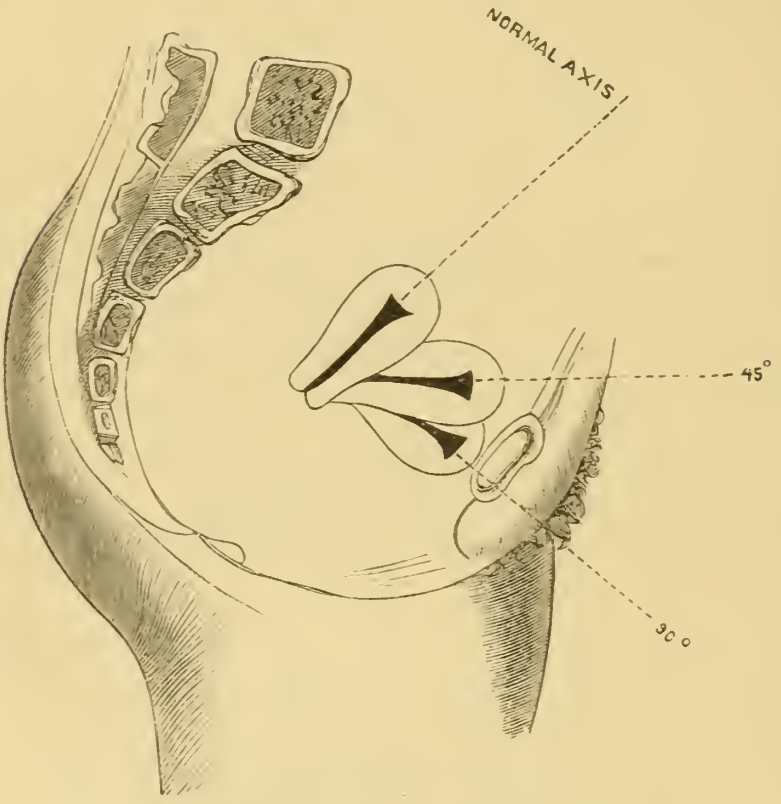
Hemorrhage.

Nervous and dyspeptic symptoms which attend uterine disorders in general.

Interference with locomotion has been noticed by Thomas.

Physical Signs.—The condition becomes evident upon bimanual examination; the degree of version varies, it may be so excessive that the fundus pushes before it the anterior vaginal wall.

Fig. 24.



Degrees of anteversion of the uterus.

Differential Diagnosis.—Same as in anteflexion.

Complications.—Those of uterine displacements in general.

Course and Prognosis.—Though occasionally cured by pregnancy, usually the course presents a persistent or increasing condition of the displacement. Treatment usually produces good results.

Treatment.—Same as that of anteflexion; the only differences are that anteversion is nearly always readily reduced (unless bound down by adhesions), that the

complicating condition, such as metritis, etc., often requires most treatment, and that operative interference is never called for or resorted to. The pessaries employed are the same as are used in anteflexion.

Posterior Displacements of the Uterus.

Retroflexion of the Uterus.

Definition.—A bending of the body of the uterus upon itself, so as to form an angle, the opening of which is posteriorly.

Etiology and Occurrence.—It is a very common pathological condition. The predisposing causes are those of uterine displacements in general. The exciting causes are increased uterine weight, traction upon the uterus, pressure and diminished uterine supports, examples of which are to be found under displacements of the uterus in general.

It is rare in nulliparæ, which fact is explained by the great frequency of this form of displacement after parturition—when subinvolution, chronic metritis, ruptured perineum and its results, dorsal decubitus, and tight bandaging unite in producing this condition.

Symptoms.—These result from congestion of the uterus, obstruction to menses and semen, pressure upon surrounding parts, and interference with the general health attendant upon uterine disease in general.

The most common symptoms are:

Feeling of weakness and pain in back, especially on exertion.

Heavy feeling and pain in pelvis.

Constipation.

Rectal tenesmus.

Leucorrhœa.
Menorrhagia.
Tendency to abort.
Nervous and dyspeptic symptoms.
Less commonly we have added:
Dysmenorrhœa.
Dyspareunia.
Sterility.
Uterine colic.
Paralysis of lower extremities (from pressure on nerves).

The reason dysmenorrhœa and sterility are less common in retroflexion than in anteflexion, is on account of the former usually occurring in multiparæ in whom the cervical canal is large and patulous. When, however, conception occurs in cases of retroflexion, abortion frequently results.

Physical Signs.—On vaginal examination, the cervix is felt in its normal place or low down, looking directly downward, whilst behind, a rounded body is felt to be continuous with the cervix, but separated by an angle; the fundus moves with the cervix. Upon bimanual examination, we can make out nothing except the absence of the fundus in front, unless the abdominal walls are very lax. By rectal examination we feel the fundus behind.

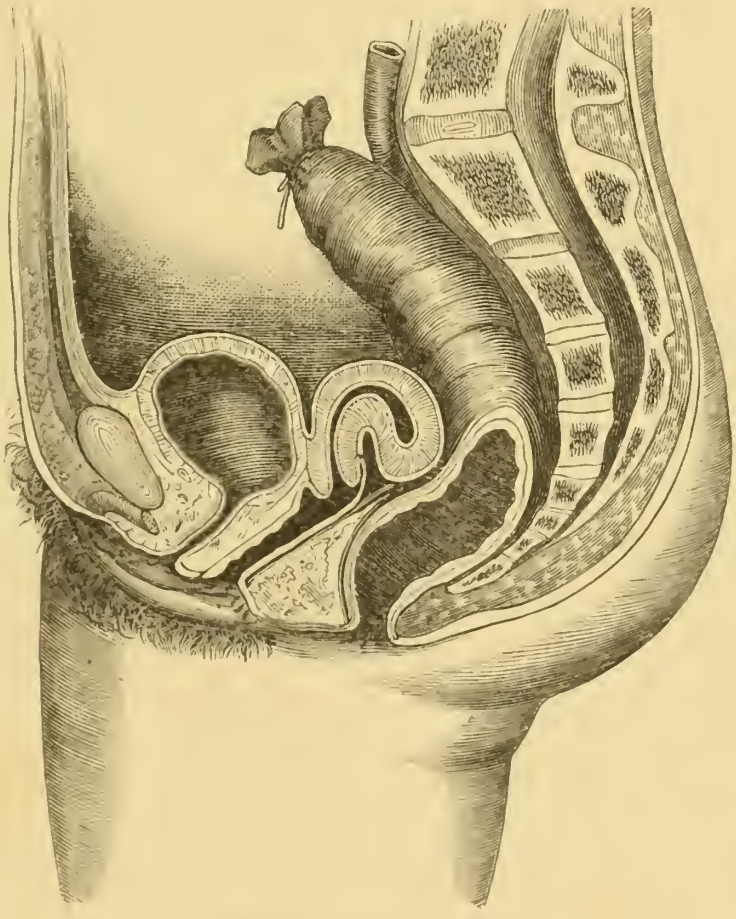
Should any further doubt exist, the uterine sound or probe is employed gently. (Fig. 24.)

Differential Diagnosis.—It may be confounded with feces in the rectum, cellulitic deposits behind uterus, peritonitis, hæmatoma, carcinoma, tumors of the posterior wall of the uterus, extra-uterine gestation, prolapsed and enlarged ovary, small ovarian tumor, and prolapse of the kidney; all these can be differen-

tiated with ease, by a careful examination as above described.

Results.—Those of uterine displacements in general, but more especially endometritis, chronic metritis, dysmenorrhœa, sterility, abortion, and perimetric inflammations.

Fig. 24.



Retroflexion of the uterus.

Prognosis.—Depends upon the extent and previous duration of the displacement. The prognosis is unfavorable when the case is one of long standing, when strong adhesions bind the uterus down, when the cervix is short so that the application of a pessary is difficult, and where some important complication, such

as tumor, exists. Under these circumstances, cases are unfavorable as regards cure; but nearly all cases can be benefited more or less, even if not cured, by the adoption of proper treatment.

TREATMENT.—Attention to the general condition of the patient and to the removal of causes when possible, is of great importance.

Replacement.—a. Thomas prefers the following method: The woman being in Sims's position, and the operator standing behind her,the index and middle fingers of the right hand are introduced into the vagina, with their palmar aspect toward the rectum; these lift up the body of the uterus until it becomes erect, and their dorsal surfaces push the organ toward its natural position; the middle finger still retaining its position, the index finger is placed in front of the cervix, and the latter then pushed backward, the middle finger, now placed in front of the cervix, assisting.

b. Bimanual recto-vaginal manipulation: the finger of one hand in the rectum pushes the fundus forward, one finger of the other hand in the vagina pulls the cervix backward.

c. Genu-pectoral position greatly aids reduction by making use of the force of gravity. This position alone may be sufficient to replace the uterus; but usually pressure upon the fundus by vagina or rectum must be employed in addition; the vagina should be kept open to allow the entrance of air. The exercising of this position for several minutes, morning and evening, is a valuable adjuvant to treatment, even after replacement.

d. Sims's repositor, consisting of a jointed sound, the small arm of which can be moved, is often useful.

e. Uterine sound may be used, but requires great

gentleness, since the amount of force employed is more difficult of regulation than when the fingers are employed. It should be introduced as straight as possible, the uterus lifted with it, and the sound carried forward; it is then gently carried backward to the perineum, and the uterus thus straightened and replaced.

When any perimetric inflammation or strong uterine adhesions exist, replacement should not be attempted; this caution applies especially to the use of the sound.

Retention of the Replaced Uterus.—This is effected by means of a *pessary*, sometimes by *shortening the round ligament*, and occasionally by *stitching fundus to anterior abdominal wall.* What has already been said about the preparation of patients for the wearing of pessaries, and the general rules observable during their use, are applicable here. Very often the vagina will not tolerate a pessary until it has been prepared by plugs of glycerin-soaked cotton introduced after reduction, and so placed that the organ is kept in the desired position. A sponge or inflated rubber pessary may have to be worn some time before a hard rubber one is tolerated. Reduction will often have to be done a number of times by the physician, before we can rely upon pessaries to continue the retention.

The retroflexion pessaries most frequently used are Hodge's, Albert Smith's, Thomas's, Meigs's ring, Hewitt's; when great weight is to be supported, Cutter's retroversion pessary, or Thomas's modification answers best; should great tenderness exist, Hurd's, or a sponge pessary, or vaginal tampons, so applied as to correct the displacement, should be used.

Introduction of Pessaries.—No amount of description will enable the student to select and apply prop-

erly a pessary, so that it is effective and still causes no pain; practical demonstration and experience are necessary for this acquisition.

Nevertheless, the principle of introduction is this: Taking, for example, a simple Hodge pessary, we notice two curves, an upper larger one, and a lower smaller one. The instrument is introduced with the upper larger end first, and the transverse diameter vertical, so as to correspond to the direction of the vulvar fissure; when it has gained the vagina, it is rotated so that the concavity of the upper larger curve looks forward; it is guided upward, so that the upper end passes behind and above the cervix, the lower end projecting against the anterior vaginal wall within the vulva.

Shortening the Round Ligaments—Alexander's Operation.—Within recent years an attempt has been made to correct this variety of displacement by shortening the round ligaments. This operation was first performed in 1881, by Alexander, of Liverpool. The steps of the operation are as follows: The mons veneris is shaved and the external abdominal ring sought for. An incision, five to ten ctm. in length, is then made in an outward direction from the pubic spine, parallel to Poupart's ligament. The incision is carried through the skin and subcutaneous fat down to the intercolumnar fascia covering the ring. The external abdominal ring is recognized by oblique fibres crossing it, by the protrusion of fat at its lower end, and by its depressibility. "The tissue now bulging out from the ring, the end of the ligament, before entering the mons veneris, is lifted by an aneurism-needle, grasped by the finger, and pulled out gently, any bands preventing this being cut with the knife."

The other side is treated in the same way, both ligaments being pulled out as far as possible. The wound is then stitched, the sutures (catgut, silkworm-gut, or silver) being passed from one side of the incision to the other—*i. e.*, through skin, pillar of abdominal ring, round ligament, pillar of ring, skin. The after-treatment consists in keeping the patient in bed for two or three weeks, and having her wear a vaginal pessary for several months.

The operation is not unattended by danger, and some deaths have followed its performance. It has met with considerable opposition, especially on the part of German gynecologists; Winckel, for instance, claims that it only changes one pathological condition into another, causing an abnormal fixation and producing an anteversion, which eventually becomes an anteflexion.

Hysterorrhaphy—Kelly's Operation.—This is performed by making a small incision through the abdominal wall on a level with the fundus, introducing the fingers, lifting fundus and stitching it with silk to the anterior abdominal wall. This operation is of too recent date to allow any positive conclusions regarding its utility; up to the present time it has not been performed often. Prof. Lusk regards it with great favor and has had excellent results.

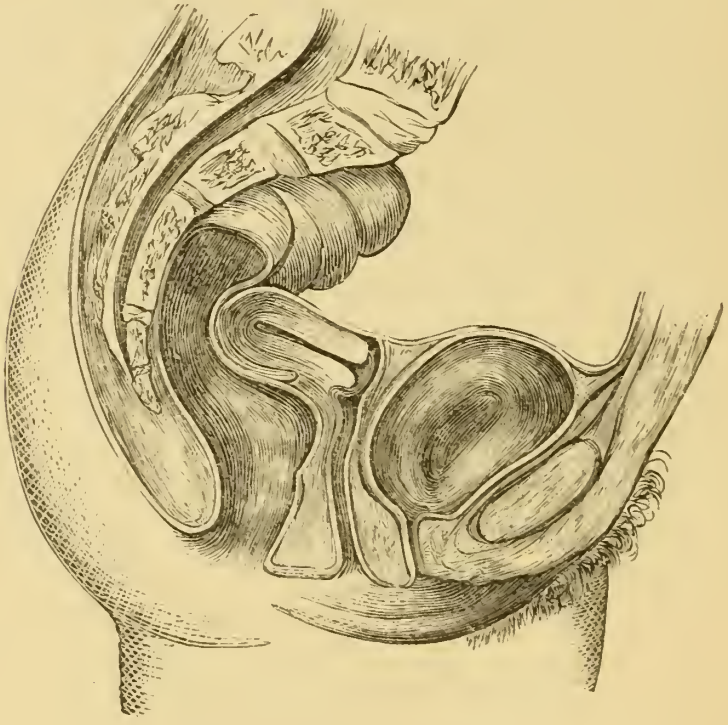
Retroversion of the Uterus.

Definition.—A change in the axis of the uterus due to approach of the fundus posteriorly toward the sacrum, the cervix advancing toward the symphysis pubis. It occurs physiologically during distention of the bladder.

Varieties.—It is spoken of as existing in the first, second, or third degree, according to whether it forms an angle of 45, 90, or 135 degrees, respectively, with the normal axis of the uterus.

Etiology and Occurrence.—Etiology is the same as that of retroflexion. It occurs, however, more equally in both nulliparæ and multiparæ, and, hence, is not so frequently connected with parturition as is retroflexion. The same causes will produce retroversion or retroflexion, according to whether the uterus is, or is not, of proper consistence and firmness. Retroversion usually precedes retroflexion.

Fig. 25.



Retroversion of the uterus.

Retroversion may be produced suddenly by violent exertion, falls, blows, etc., and then gives rise to acute and grave symptoms—shock, peritonitis, etc.

Physical Signs.—Those of retroflexion, but we do

not find any angle between the cervix and the fundus, but these parts are found directly continuous and in the same axis.

Symptoms, Differential Diagnosis, Course, Prognosis, and Treatment.—Same as for retroflexion.

Lateral Displacements of the Uterus.

Definition.—Lateroversion is an inclination of the uterus to one or the other side; a slight right lateroversion is physiological. Lateroflexion is a bending of the uterus, so that the cervix, or the body, or both, are directed to the right or to the left.

Occurrence.—These varieties of displacement are frequent enough, but usually simply complicate other forms, or exist to such a slight degree as to be of no import. Lateroflexion frequently exists with lateroversion.

Etiology.—They may be congenital or acquired; the chief causes of the acquired form are tumors on one side of the uterus, and parametric and perimetric inflammations producing adhesions.

Symptoms.—They rarely give rise to symptoms, and rarely cause obstruction to the uterine canal.

Diagnosis.—Is easy by the methods already mentioned in other displacements.

Treatment.—Is rarely required. Should it be desirable to correct the displacement, it should be treated as in cases of forward or backward displacements, the use of the intrauterine stem being most likely required.

Hernia of the Uterus.

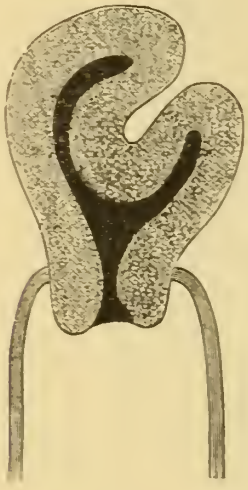
A protrusion of the uterus through some abnormal opening. This is a very rare condition; when it

occurs, it is usually secondary to hernia of the ovary, the latter dragging the uterus after it. It is most frequent in the pregnant state. The situation of the hernia has been found to be ventral, crural, inguinal, and ischiadic. A protruded uterus may become impregnated. The diagnosis is easy, and no especial treatment can be advised, since the condition is usually irreducible.

Inversion of the Uterus.

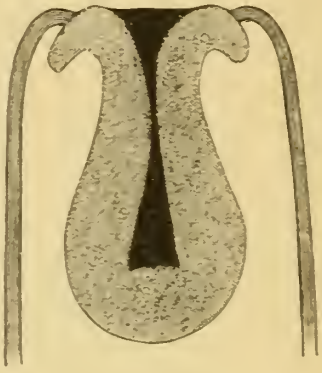
Definition.—A turning of the uterus inside out, by which the internal tends to become the external surface.

Fig. 26.



Partial inversion.

Fig. 27.



Complete inversion.

Classification.—The condition is spoken of as:

(*a*) Puerperal and non-puerperal, according to whether it occurs with parturition.

(*b*) Acute and chronic, according to whether produced suddenly or gradually.

(*c*) Partial and complete, according to whether the inverted fundus has or has not passed through the external os of cervix.

Occurrence.—It occurs most frequently with labor, these forming seven-eighths of the cases reported. But even in the puerperal state it is of very infrequent occurrence.

Etiology.—Authorities differ in regard to the rationale of its production; the most generally accepted theories are that one or more of the following three statements explain its production:

(*a*) Prolapse of some part of the fundus dragging the rest of the uterus after it.

(*b*) Prolapse of some part of the fundus, which is further extruded by contraction of the rest of the uterus provoked by the original displacement.

(*c*) Eversion of the cervix going on to prolapse, and causing the same condition of the rest of the uterus.

Depending upon diminished tone or resistance of the uterine walls, and pressure from above or traction from below, the causes may be divided into predisposing and exciting.

Predisposing Causes.—Anything which diminishes the tone and resistance of the uterus, either by changes in structure or thickness.

Examples.—Parturition.

General debility and wasting diseases.

Distention by fluids.

Distention by tumors, etc.

Exciting Causes.—Pressure from above—muscular efforts.

Traction from below—traction on placenta, traction by polypi or other uterine tumors.

As above stated, seven-eighths of all cases have been found to occur during parturition. Four-fifths of the remaining one-eighth occurred as a result of uterine polypi. In rare instances, partial or complete

inversion has been known to take place in an apparently perfectly healthy uterus, as a result of severe muscular exertions.

Pathology.—The cervix usually retains its normal position, and is not inverted; rarely, however, this may take place. One horn only of the uterus may, in rare cases, have been inverted.

After inversion, the uterus may suffer additional changes. Involution may take place, or it may remain large, succulent, and easily bleeding; or, by contraction at the cervix, gangrene may result; the epithelium of the endometrium may be replaced by a layer of the pavement variety.

The peritoneal cup in the uterus at first often contains the ovaries and tubes, but these leave it after a time and it contracts, though peritoneal adhesion of the two margins does not often take place. The bladder retains its normal position.

Symptoms.—1. *Of Acute Cases.*—Feeling as if something had given way.

Pain in pelvis.

Hemorrhage.

Interference with micturition.

Shock; this may terminate in fatal collapse, or the case go on to recovery, and then present the symptoms:

2. *Of Chronic Cases.*—Hemorrhage; menorrhagia, and metrorrhagia, the latter increased by exertion and coition.

Variable degree of pain in pelvis.

Pain in back.

Difficulty in locomotion.

Difficulty in micturition.

Difficulty in defecation.

Anæmia and its symptoms (due to hemorrhage).

Though this list of symptoms is usually present, there are some cases in which the condition gives rise to so few symptoms, that the patient does not seek advice, and the condition may only be recognized accidentally.

Physical Signs.—When occurring during labor, no difficulty will be experienced in diagnosticating the condition.

In chronic cases the following points serve to guide us:

1. A globular body of variable size, and which bleeds easily, is found in the cavity of the uterus, or protruding from the cervix into the vagina.

2. The finger or sound passed around this tumor in an upward direction recognizes the continuity of its outer surface with the inner surface of the cervix, and finds the uterine canal much shorter than normal.

3. By pressure upon the abdominal wall, in thin persons, we recognize the absence of the uterus from its normal position, and may feel the depression existing in its place. This may also be discovered by drawing the inverted fundus down, and feeling the depression by a finger in the rectum, or by this aided by the hand upon the abdomen, or a sound passed within the bladder—these can be approximated, and thus the absence of the fundus demonstrated.

4. The openings of the Fallopian tubes can usually be seen.

5. Upon compressing the inverted uterine fundus it sometimes contracts.

6. Its pedicle or connection with the cervix is usually thick.

7. Acupuncture will give pain.

Differential Diagnosis.—By carefully applying the

foregoing points differentiation will usually be easy. The conditions which might be confounded with inversion of the uterus are uterine polypi and fibroids.

Course and Prognosis.—The patient may die in collapse after the acute form; or recovering from the immediate effects of the accident may go on and suffer from the symptoms of the chronic variety.

In rare instances spontaneous cure has taken place; and in a few cases the condition had never been remedied, and still the woman continued to enjoy a very comfortable existence.

But in general the prognosis is serious if the condition be unrelieved, on account of the hemorrhage, anæmia, and danger of peritonitis. Most of the cases can be reduced; others are irreducible, and require further interference. Taken collectively, the prognosis as to cure from interference is pretty good.

Treatment.—Consists in reduction when possible; when irreducible, in controlling the discharge and hemorrhage by local means; or, as a last resort, or when gangrene or a malignant growth exists as a complication, in amputating the uterus.

1. *Reduction.*—This may be accomplished gradually or rapidly. Long duration is no contra-indication to reduction, since it has been done after thirteen years' existence of the inversion. The gradual method is preferable to the rapid plan, and should always be tried first, since it is safer.

Gradual Reduction.—The following methods have been used:

(*a*) Pressure exerted by a cup surmounted upon a stem, which is supported by elastic bands passing in front and behind to an abdominal belt around the hypogastrium, by which counterpressure is made upon

the uterus (Barnes and Hicks). When there is a disposition to displacement of the cup, tampons should be placed around it. This is a very good method; it must be persisted in for at least two or three weeks.

(*b*) Pressure by vaginal water or air bags, prevented slipping out of the vagina by plaster; counterpressure is exerted by a compress and bandage around the lower part of the abdomen.

(*c*) This plan may be modified by kneading the uterus for ten minutes, night and morning, in addition to the use of the vaginal bag (Tyler Smith).

(*d*) Cold applied to the uterus by means of a stream of water for several minutes, night and morning (Martin), may be effective.

Should these measures prove ineffective after trial for several weeks, or should they not be tolerated by the patient, we should discontinue them and then try

Rapid Reduction.—The patient should be prepared by rest and vaginal injections of very warm water three times a day for several days preceding the attempts. At the time of reposition, the bowels and bladder having been previously evacuated, the woman is placed in the lithotomy position and fully anæsthetized. There are numerous methods of rapid reduction.

(*a*) One hand being placed over the abdomen, the other is passed up the vagina and pressure exerted directly upon the fundus (Valentin).

(*b*) One or both cornua are indented (Nœggerath).

(*c*) Four fingers being spread around the uterus, the thumb is spread against the fundus, the neck being forced against the sacrum (Barrier).

(*d*) The fingers and thumb encircling the body and pressed outward as much as possible, the uterus is lifted up, and the other hand being on the abdomen, an

attempt made to roll out the parts forming the ring (Emmet).

(*e*) Instead of the point of resistance being at the abdomen, it may be in the rectum by two fingers passed into this part of the gut and dipped into the cervical ring (Courty).

(*f*) Or by fingers in both rectum and bladder, the urethra having been dilated (Tate).

(*g*) The cervix may be incised to allow more easy reduction (Barnes).

(*h*) Instruments may be used for exerting pressure or counterpressure. For the former purpose, White's repositor may be used; it consists of a cup attached to an elastic spring, which latter is placed against the operator's chest; with this instrument pressure is made upon the fundus, which with the cup is steadied by the hand in the vagina. Or Byrne's repositor, consisting of a cup which is made smaller as the inverted uterus gradually becomes reduced, may be used. Instead of abdominal pressure by the hand, a cone of wood may be pressed into the abdominal ring of the uterus (Thomas).

Many attempts may have to be made before complete success is accomplished; the methods of reduction may have to be varied. Not more than an hour or two should be spent in each attempt; the amount of reinversion then accomplished should be retained by the use of vaginal elastic bags, or by Emmet's plan of closing the external os with sutures.

Should a tumor exist, removal of this will usually make reduction easy.

When all these means fail, we should adopt some means of

2. *Checking Hemorrhage, the Uterus being Left Inverted.*—This can sometimes be done by astringent

washes and tampons, or by the use of caustics, so as to harden the uterine mucous membrane and thus check hemorrhage; this hardening occurs spontaneously in some cases.

3. *Thomas's method* is offered as a substitute for amputation. It consists in abdominal section over the cervical ring, dilatation of this with a glove-stretcher-like instrument, and then reposition. Though only performed in two cases (one of which resulted fatally), it may, after further trial, be found preferable to amputation.

4. *Amputation of the Uterus.*—Should all the preceding methods fail and marked symptoms still persist, the uterus have become gangrenous, or the condition be complicated by a malignant growth of the inverted portion, amputation (though dangerous, mortality 25 per cent.) should be resorted to.

This may be done by knife, scissors, écraseur, or galvano-cautery. The operation should be preceded by the application of a tight ligature around the cervix for two or three days, thus obliterating the vessels in the inverted portion, and causing a commencing gangrene when the operation is performed; or sutures of wire or silk may be passed through the cervix as high as possible and drawn tight, so as to compress vessels and close the peritoneal cavity, thus lessening hemorrhage and forming union.

After removal the lips are brought together by deep sutures, and between these are superficial ones to approximate the mucous membrane.

The uterus has been allowed to slough off after ligation; but this method of amputation is much more fatal than other plans, and should, therefore, never be resorted to.

CHAPTER VI.

AFFECTIONS OF THE UTERUS (*continued*).

Tumors of the uterus—Uterine fibroids—Fibro-cystic tumors of the uterus—Uterine polypi—Cancer of the uterus—Sarcoma of the uterus—Adenoma of the uterus—Papilloma of the uterus—Uterine moles.

Tumors of the Uterus.

These are benign and malignant.

Benign:	*Malignant:*
Fibroid.	Carcinoma.
Fibro-cystic.	Sarcoma.
Polypi.	Adenoma.
Papilloma.	

Besides these there are a few more varieties of very rare occurrence, and hence not warranting description.

Fibroid Tumors of the Uterus.

DEFINITION.—A tumor, developed in some part of the uterus, consisting of muscular and fibrous elements in varying proportions.

SYNONYMS.—Uterine fibroids. Myomata. Fibromyomata. Fibromata. Leiomyomata. Fibrous tumor of the uterus.

OCCURRENCE AND ETIOLOGY.—They are very common. They never develop before puberty, nor after the menopause. The period of greatest liability is from thirty to fifty years.

In regard to causation, we know nothing definite;

the African race is peculiarly liable; it occurs twice as frequently in the married as in the unmarried; amongst the married it is more frequent in multiparæ than in nulliparæ.

Pathology.—Under this subdivision, the number, size, situation, structure, varieties, changes in the uterus, degenerative changes, and complications will be described.

Number, Size, and Situation.—They may be single or very numerous—fifty or more may be present. They vary in size from that of a small nut to that of a man's head or even larger. They are usually situated in the body of the uterus, rarely in the cervix; most frequently on the posterior wall, less frequently on the anterior, rarely on the sides of the uterus.

Structure.—They are composed of unstriped muscular fibres and of fibrous tissue in varying proportions, hence they are properly called fibro-myomata; usually the fibrous tissue is in excess. They are entirely or almost completely surrounded by a loose fibrous capsule. They are not very abundantly supplied with bloodvessels; but occasionally they have a cavernous structure due to dilated bloodvessels, and then constitute the telangiectatic or cavernous variety. The tumors feel and cut hard, are of a pale pinkish color, and on section and microscopic examination, present bundles of fibrous and of unstriped muscle tissue in varying proportions having a concentric arrangement around one or more centres.

Varieties.—Although arising in all cases within the uterine wall, they expand in different directions as they grow, and hence are divided into interstitial, submucous, and subperitoneal.

(*a*) Interstitial. These remain within the wall of the uterus and are usually multiple.

(*b*) Submucous. These project into the uterine cavity, being covered by the mucous membrane; they are usually single. They either remain sessile—being continuous with the uterine wall over a large area—or become pedunculated, when they are known as fibrous polypi; these polypi may be extruded into the vagina, even spontaneously expelled by destruction of the pedicle, or very rarely enucleated by rupture of the capsule.

(*c*) Subperitoneal. These project into the abdominal cavity, being covered by peritoneum. They are usually multiple. They may attain great size. They may remain sessile, or become pedunculated; in the latter case, the tumor may make extensive excursion in the abdominal cavity, or even form the contents of a hernial sac. By traction these tumors sometimes cause a stretching of the vagina and cervix; occasionally they become detached and remain free in the peritoneal cavity, or excite inflammation, and adhere and become nourished by some part of this serous lining; or the detached tumor may undergo degenerative changes.

Changes in the Uterus.—The uterine wall usually becomes hypertrophied; in the subperitoneal variety it may become thinned out. The organ is frequently displaced; occasionally it becomes inverted or prolapsed, rarely twisted.

Degenerative Changes.—The tumor occasionally undergoes the following changes:

(*a*) Softening. This may be due to simple œdema, fatty or myxomatous degeneration.

(*b*) Induration. Usually combined with fatty degeneration.

(*c*) Calcification. Commences in the centre and extends outward; it does not occur in the submucous form; it may be accompanied by suppuration. This form of degeneration gives rise to the so-called uteroliths, or womb-stones, which occasionally become detached.

(*d*) Suppuration. Usually due to traumatism; it affects usually the submucous form; it is often complicated with the calcific or the gangrenous forms.

(*e*) Gangrene. Is also the result usually of traumatism. It may effect a cure or cause death from septicæmia or peritonitis.

Whether fibroids ever become changed into malignant tumors is doubtful; such cases have been observed, but may only have been coincidences.

Complications.—Often exist, and the presence of these often leads to the examination which discovers the tumor. They are:

Displacements of the uterus.
Endometritis.
Chronic metritis.
Disorders of menstruation.
Cystitis.
Hydronephrosis.
Obstruction of the rectum.
Hemorrhoids.
Varix of veins of lower extremities.
Chronic local peritonitis.
Hypertrophy of the uterine walls.
Atrophy of the uterine walls.
Elongation of the cervix.
Inversion of the uterus.

Symptoms.—Some cases have no symptoms whatever. The submucous fibroids are most apt to give rise to symptoms, the subperitoneal are least apt to.

The symptoms are due to four causes:

1. Interference with the health, due to loss of blood and mental effect of the existence of the tumor.
2. To the existence of the tumor itself.
3. Pressure effects of the tumor.
4. Interference with menstruation and conception.

1. From the first cause there result:
   Depreciation in general health, anæmia, dyspeptic symptoms, etc.
   Mental depression.
2. From the second cause:
   Leucorrhœa.
   Metrorrhagia.
   Serous discharge ftom the uterus.
   Feeling of weight in pelvis.
   Pain in pelvis.
   Uterine pain.
   Peritonitic pain.
3. From pressure of the tumor, there result:
   Upon bladder—irritability of bladder and cystitis.
   Upon rectum—irritability of rectum, or constipation and hemorrhoids.
   Upon bloodvessels—varix of lower extremities.
   Upon nerves—neuralgia, and, rarely, paralysis of lower extremity.
   Upon ureters—hydronephrosis (rare).
4. From fourth cause:
   Dysmenorrhœa.
   Sterility.

Not all of these symptoms are present in any one

case; some have few, others many, depending upon the size and situation of the tumor.

Physical Signs.—These are usually readily made out, and no difficulty in the diagnosis occurs; but occasionally both the small and the large tumors require very careful examination to differentiate them from other conditions.

The patient being in the dorsal decubitus, and bladder and rectum having been emptied, both the anterior and posterior surfaces should be examined, by one hand upon the abdomen and two fingers of the other hand in the vagina or rectum; in addition, the cervix may be drawn down, and examination by vagina and rectum then again gone through.

The cavity of the uterus should also be explored by the sound (having previously excluded pregnancy); or, if this does not suffice, the cervix may be dilated, and the finger passed up into the uterine cavity. When doubt still exists, the hand may be passed into the rectum, and be made to explore as per Simon's method.

By these means we discover a tumor of variable size, sessile or pedunculated, projecting in different directions from some part of the uterus. We find it to be a localized enlargement, of firm consistence, not tender, and it is more or less asymmetrical. The cervix is hard. In passing the sound, we find the uterine canal usually tortuous and pressed over to one side.

Differential Diagnosis.—Fibroids may be confounded with:

Pregnancy.
Chronic metritis.
Peri uterine cellulitis.
Pelvic abscess.
Pelvic hæmatocele.

Anteflexion.
Retroflexion.
Fecal impaction.
Ovarian tumors.
Extra-uterine pregnancy.
Uterine moles.
Cancer of the uterus.

The following points will serve to differentiate :

Pregnancy.—Cervix and uterus are soft, symmetrical, and median, and we have amenorrhœa and mammary and other symptoms of pregnancy. The uterine bruit may be heard over fibroids.

Chronic Metritis.—Uterus is flatter, symmetrically enlarged, and tender. The sound passes up the middle of the patulous and lengthened canal.

Peri-uterine Cellulitis.—There will usually be the history of an acute attack with fever, etc. The tumor is irregular in outline, firmly connected to the pelvic wall, and hence immovable, very sensitive, and binds down the uterus.

Pelvic Abscess.—History is distinctive; the tumor will be immovable, sensitive, and fluctuating.

Pelvic Hæmatocele.—Inversion is usually acute, and accompanied by marked constitutional symptoms; the tumor is soft at first, and fluctuating, tender, and uterus is felt of normal size.

Anteflexion and Retroflexion.—Fibroids are usually harder. Examination by sound, rectal and bimanual methods, and by sound combined with abdominal palpation, readily clears up any doubt.

Fecal Impaction.—It is of short duration, accompanied by its peculiar symptoms, can be indented, is found most frequently in the caput coli, does not move

with the uterus; the latter is found in its normal position and performs its functions undisturbed.

Ovarian Tumors.—When large and cystic can readily be diagnosticated. In the rare cases of solid ovarian tumors, these can be moved independently of the uterus, and are usually unaccompanied by menorrhagia or metrorrhagia. When attached to the uterus, differentiation is sometimes difficult.

Extra-uterine Pregnancy.—Presents the mammary and other signs of pregnancy; history of more rapid growth, and tumor is soft and fluctuating.

Uterine Moles.—These also are soft, spongy, and fluctuating; the cervix is soft. Microscopic examination of the discharge often shows placental villi.

Cancer of Uterus.—Easily distinguished. There is more constitutional disturbance, with cachexia; the infiltration is more diffuse, and usually attacks cervix; microscopical examination reveals character.

Course and Prognosis.—In very rare cases, fibroid tumors of the uterus have proved fatal by exhaustion, hemorrhage, suppuration and septicæmia, and by peritonitis. But usually this does not happen. They grow slowly, and often seriously incommode the patient, until menopause, when they frequently take part in the senile atrophy, and are thus practically or relatively cured. Even before this period, spontaneous cure occasionally takes place by absorption or atrophy, rupture of the pedicle and extrusion, by enucleation, by fatty degeneration, by calcific degeneration, by suppuration, and by sloughing. Sometimes they undergo cystic degeneration.

The prognosis as regards life is good; in regard to amelioration of symptoms, it is good after the meno-

pause; even before this period we can make the woman pretty comfortable by the proper attention.

Treatment.—May be palliative or radical.

Palliative Medical and Surgical.—In most cases palliative treatment is all that is justifiable, and we can often render the woman very comfortable in this way.

Existing complications should, when possible, be removed; uterine displacements should be rectified; often by lifting up the uterus out of the pelvic cavity so as to give it more room, great relief from symptoms will follow. The patient's general health should be improved by change of air, sojourn at a watering-place, etc.

The most troublesome and serious symptom, very often, is the hemorrhage, both during and between the periods, which is kept up by the congestive condition of the endometrium, excited by the presence of the tumor. To control this, the woman should be kept in bed during the menstrual period, and take one or other of the hæmostatics: ergot, tannic and gallic acids, cannabis indica, opium, aromatic sulphuric acid, etc.; an astringent tampon should be used after a moderate loss of blood has taken place. Should uterine fungosities exist, these should be removed by scraping.

Very often by these means we can give considerable relief; but in other cases the hemorrhage still continues; then we may try section of the cervical neck by knife, scissors, or cautery (how this proves efficacious we do not know); or we may make an incision into the mucous covering of the tumor and its outer layer, and thus by dividing its bloodvessels diminish its blood supply. Both of these methods may accomplish the desired object, and are useful, especially since they

are the first steps in the operation for removal by the vagina.

Ergot, by causing a contraction of the muscle fibres of the uterus and thus diminishing the blood-supply and favoring pedunculation and expulsion of the tumor, is an important remedy. Some cases have been cured by this drug, and in many cases the tumors have diminished in size or remained stationary, and the hemorrhage and the leucorrhœa been checked. Interstitial and submucous tumors are the most favorable for this treatment. It is used preferably by hypodermatic injections of ergotine or the aqueous extract (Squibb's and Merck's ergotin are the best), in the proportion of 3 parts to 7½ each of water and glycerin. The needle is inserted deeply into the hypogastric or gluteal regions; three grains are used each time, and the operation repeated at intervals of several days for two or three months. Cutaneous abscesses and ergotism occasionally result. The drug may also be given by mouth or rectum.

Other so-called absorptive drugs have been tried, but with no success; the ones most commonly used were iodine, potassium bromide and iodide, arsenic, phosphorus, tincture of the chloride of iron, lead, and lime.

Electrolysis has been resorted to with favorable results. A few cases were cured and many relieved and the growth arrested, but some resulted fatally. A galvanic current is passed through the tumor by puncturing the abdomen on each side with steel electrodes; with this instrument, a diet consisting largely of nitrogenous matter is selected. Apostoli has used this method with excellent results.

Radical Surgical Treatment.—After all palliative and

medical treatment has been tried without benefit, we should, where the indications are urgent, remove the tumor. This can be done by vagina and by abdominal section.

(*a*) *By Vagina.*—Removal by the vagina is to be resorted to when there is more or less projection into the uterine cavity; hence only in submucous and interstitial forms, and when the cervix can be sufficiently dilated; these two considerations make the case a more or less favorable one.

As a preliminary step to the operation, the cervix should be dilated, by tents, by Barnes's or Molesworth's dilators, or by incisions with the knife or scissors, or, preferably, as practised by Thomas, with the cautery.

The next step depends upon whether the tumor is polypoid or more extensively connected with the uterus. When polypoid, the pedicle may be cut through by knife, scissors, cautery, or Chassaignac's chain or Hicks's wire écraseur, or the tumor may be seized by forceps and twisted off; these polypoid growths are the easiest cases to deal with.

When, however, the tumor is more or less sessile, after dilating the cervix, a long single or crucial incision is made through its capsule, which is then separated from the tumor for a short distance on all sides of the opening. Having proceeded thus far, some operators leave the case to Nature, aiding the latter by administration of ergot, in order to secure contractions of the uterus, and thus pedunculation and extrusion of the tumor. Though in some cases this will result, in others such a favorable issue does not take place; whilst in still other cases the death and sloughing of the tumor results, and then requires immediate removal, since its

retention and gradual disappearance by decomposition is so prone to be followed by septicæmia; it is bad practice to leave such a tumor, and on account of the danger of this accident, this mode of effecting a cure is considered hazardous and is condemned.

Enucleation of the tumor is always preceded by dilatation of the cervix and incision into the tumor, as above described; possibility of enucleation depends upon the fact that the tumor is surrounded by a zone of loose connective tissue. It may be accomplished by scissors when the tumor can be drawn down so as to become visible. Often this cannot be done, and then the finger-nail or handle of a scapel may be used for this peeling; if these are not powerful enough, Emmet's serrated steel nail or Thomas's spoon-saw, both of which are readily managed, accomplish the result, with the minimum risk of injuring the uterine wall and with little hemorrhage. Thomas speaks very highly of the spoon-saw, and in his hands it has achieved excellent results; he also recommends the use of the elastic flat whalebone probe as a superior method of indicating the degree of attachment of the tumor.

The tumor very often has to be removed piecemeal, on account of its size; in this case we should be careful to remove all of it, if possible. When very large, the obstetrical forceps and volsella may be used to aid delivery.

Though no figures indicating the mortality of enucleation are obtainable, it is a dangerous operation, the degree of danger depending upon the size and extent of attachment of the tumor; the causes of death after this operation are shock, hemorrhage, perforation of the uterus, peritonitis, and septicæmia.

(*b*) *By Abdominal Incision—Laparotomy—Gastrotomy.*—This operation is performed when the tumor cannot be extracted by the vagina; it is applicable to the subperitoneal and to certain of the interstitial forms. It is a formidable operation, and, like enucleation, is only resorted to as a last resort. Bigelow has recently published statistics which give 63 per cent. of recoveries in all recorded cases; included in these are the operations of Bantock, Hegar, and Keith, in which the percentage of recoveries was 90, 91, and 92 respectively; this would indicate that we are justified in anticipating more favorable results of the operation in the future.

There are several variations in the steps of the operation, as performed by different gynecologists; the following is an outline of the proceedings:

A median abdominal incision is made from half an inch above the symphysis pubis, upward to a variable extent toward the umbilicus, depending somewhat on the size of the tumor to be extracted.

The cervix is constricted by a ligature or clamp passed below the seat of the tumor, and the latter cut off by knife, cautery, or écraseur, in one mass or in several pieces, and removed. When the tumor is very extensive, the entire uterus above the cervix may have to be amputated, thus increasing the risk from the operation.

The stump is usually fixed into the abdominal wound and retained there by clamp, ligature, or needles, after which the former is sewed up. Schröder leaves it intraperitoneal, making the margins of the stump oblique and adapting these and the peritoneal covering, and retaining them by silk sutures.

During the progress of the operation hemorrhage should be avoided by ligaturing large vessels. The

ovaries and tubes are often removed with the tumor and uterus, and many operators consider this advisable, since, when left behind, hemorrhage from the stump has resulted during the menstrual epoch.

Thomas uses a clamp applied to the uterus below the tumor to control hemorrhage temporarily and to retain the stump in the abdominal wound; he then pierces the stump above the seat of the clamp by a number of long pins, and applies the cautery thoroughly to the cut surfaces, after which the clamp is loosened, but kept in position for two weeks, so as to be tightened should hemorrhage ensue.

Hegar's method consists in constriction of the uterine stump with elastic ligatures, exact closure of the abdominal cavity by stitching the peritoneum around the stump, and antiseptic treatment of the latter with cautery and zinc chloride.

The after-treatment is the same as that of ovariotomy. The chief dangers are from shock, hemorrhage, peritonitis, and septicæmia. These are combated by external warmth, stimulants, rest, the clamp, cautery, and ligature, and the strictest antiseptic precautions.

Removal of the ovaries or of the ovaries and tubes, leaving the tumor and the uterus intact, has been resorted to, especially to check the hemorrhage, which is the most formidable symptom; good results have followed these operations, depending upon the atrophy which resulted, similar to that which would eventually take place at the menopause.

Fibro-cystic Tumors of the Uterus.

Definition.—A tumor of the uterus, consisting of an external myofibroid envelope and a softened centre.

They have only been recognized of late, and are of rare occurrence. They derive their chief importance from the readiness with which they are confounded with ovarian tumors.

Synonyms.—Cysto-fibroma of the uterus. Cysto-myoma. Cystoid tumor of the uterus. Cysto-sarcoma (erroneously).

Pathology.—Usually they consist of a fibroid which has undergone mucoid degeneration in the centre; in rare cases, a proper cyst-wall has been found, and they were then thought to be dilated lymphatics.

Their contents vary, and may be serous, sanguineous, or colloid; most often it is a straw-colored fluid which coagulates spontaneously upon withdrawal, and contains epithelium, fat, and suspended uterine muscle fibres—the last ingredient having been regarded as pathognomonic by Dr. Atlee.

The subserous fibroids most frequently undergo this degeneration.

Symptoms.—Same as those of fibroids.

Physical Signs.—By methods similar to those employed in the diagnosis of fibroids, we discover an indistinctly fluctuating tumor connected with the uterus; some parts of this tumor are softer than others, and if we insert a hypodermic needle, we can draw off the peculiar fluid from certain spots, whilst others may not yield any.

Differential Diagnosis.—It is most likely to be confounded with ovarian tumors and very often it cannot be differentiated from these. The points which would lead us to the belief of uterine rather than ovarian tumor, are: Irregularity in the shape of the tumor, existence of fluctuation in certain parts only, enlargement of the uterine canal, movement of the

tumor with the uterus, less rapid growth, elevation of the uterus, examination of the fluid and the finding of uterine muscle cells.

Rarely, it must be distinguished from solid fibroids and from pregnancy. From the former, the consistence, fluid contents, greater size, and more rapid growth will differentiate; whilst the latter will present the mammary and other symptoms of pregnancy, and the duration will not extend beyond nine months.

Course and Prognosis.—Course is more rapid than that of fibroid, but slower than the ovarian cyst. Prognosis is less favorable than in fibroid; no cure excepting by operation is possible.

Treatment.—Laparotomy similar to that described under fibroids; the contents of the cyst are first evacuated, and then the wall removed.

Uterine Polypi.

Definition.—Pediculated tumors, attached to the inner surface of the uterus, and consisting of some of the structural elements of the uterus variously altered.

Certain polypoid bodies, which are not included in this definition, are sometimes classified as polypi; but in reality, although they may give the symptoms of these, they are pathologically different; as examples may be mentioned moles, remains of blood-clots, and remains of retained portions of placenta.

Varieties.—We may distinguish:

1. Mucous polypi.
2. Cystic or glandular polypi.
3. Fibrous polypi.

Occurrence.—Quite frequent; they occur at a rather earlier period of life than do fibroids.

Etiology. — The cystic variety often complicates chronic endometritis; sometimes this also applies to the mucous variety. With this exception, we are ignorant of the causes.

Pathology.—*Mucous polypi* are usually developed from the mucous membrane of the cervix, are often multiple, vary in size from an almond to a pigeon's egg, are soft, succulent, highly vascular, and have the structure of the mucous membrane of the cervix.

Cystic or glandular polypi are hypertrophied Nabothian glands which have become pedunculated; less frequently they are produced by similar changes in the utricular follicles. They are usually multiple, several being bound together, so as to give rise to a conglomerate mass; they are usually attached to the cervix.

Fibrous polypi are submucous fibroids which have become pedunculated; they have the structure and peculiarities of these growths, arise from the muscular coat, and spring most frequently from the fundus. The length of the pedicle varies very much; it may be so long that the tumor hangs from the vulva. After being formed in the uterus, the contractions of the latter tend to expel it, so that it dilates the cervix and passes into the vagina. Fibrous polypi may undergo the various degenerations affecting myo-fibromata.

Symptoms. — Hemorrhage. Both menorrhagia and metrorrhagia; in the case of the mucous variety, this comes from the tumor itself; in the others, it is derived from the congested mucous membrane.

Leucorrhœa. Due to the accompanying endometritis; when the tumor lies in the vagina, there may be vaginal leucorrhœa added, from irritation.

Pain in back and pelvis, due to the uterus endeavoring to expel the tumor.

Dysmenorrhœa, of the obstructive variety.

Sterility.

Anæmia and other debilitating effects of the constant loss of blood.

Physical Signs.—Depend upon the size and variety of the polypus and the part from which it springs. Those polypi which lie within the vagina are, of course, easily recognized. Should the cervix have become dilated, diagnosis will be easy; the finger should be passed up and explore the uterine cavity. If belonging to the fibroid variety, the polypus will be firm, attached to the fundus, and the uterus will be slightly enlarged. If of the other varieties, it will be soft, usually small, and the uterus be of normal size. When the cervix is closed more difficulty will be experienced; we then use the sound, examine bimanually and by rectum, and if still in doubt, dilate the cervix and examine digitally.

Differential Diagnosis.—Must be made from sessile fibroids and inversion of the uterus. The former will be differentiated by the means given above; the latter in the manner described in speaking of inversion.

Course and Prognosis.—Rarely does a spontaneous cure by rupture of the peduncle or degenerative processes occur. The course is, therefore, progressive, unless interfered with. Usually they can be removed without difficulty. The prognosis, therefore, is good.

Treatment. 1. *Of Mucous Polypi.*—These being usually small and attached to the cervix are readily removed; the cervix may have to be dilated. The tumor is seized and twisted off with the forceps, or it may be removed with the curette. Occasionally,

the chain or wire écraseur, or the galvano-cautery wire may be required.

2. *Of Cystic Polypi.*—These are treated similarly.

3. *Of Fibrous Polypi.*—Sometimes we can accomplish good by the use of the palliative measures recommended in the treatment of myo-fibromata; but usually removal is called for. This is effected by torsion, scissors, écraseur, polyptome, or spoon-saw. If necessary to expose and get at the tumor, the cervix must be dilated. Traction and torsion are first tried and may be all that is needed, if the pedicle is thin. If unsuccessful, the pedicle is rendered tense by traction, and divided by the scissors, chain or wire écraseur, galvano-cautery, or the polyptome—a curved hook sharpened on one side.

If the pedicle is rather broad, the operation resolves itself into one for removal of fibroids as already described. When the tumor is of large size and this interferes with our getting at the pedicle, we can obviate this by longitudinal or spiral incisions into the mass, whilst we are exerting traction.

Cancer of the Uterus.

Definition. –A malignant growth of the uterus having the characters of cancer elsewhere.

Since this affection usually attacks the cervix (in 98 per cent. of cases), the following description applies principally to cancer of the cervix; the special peculiarities of the rarer involvement of the body of the uterus will be pointed out at the end of this section.

Occurrence.—In women, the uterus is the most frequent seat of cancer, being three times as frequent here as elsewhere. The majority of cases occur be-

tween forty and fifty years; it is never developed before puberty, and rarely before twenty-five or after seventy. It is more frequent in multiparæ than in nulliparæ. The African race is rather less subject to it than are whites.

Etiology.—The *predisposing* causes are:

Cancer in general is two and a half times as frequent in females as in males.

Heredity.

Age.

Enfeebled condition.

Frequent parturition.

The only authentic *exciting* cause is:

Erosion and laceration of the cervix; there is strong evidence to prove this.

Pathology.—We may distinguish four varieties of carcinoma of the uterus:

1. Epithelioma.
2. Encephaloid.
3. Scirrhus.
4. Colloid.

Of these, epithelioma is the most frequent, next comes the encephaloid; the scirrhus is rare, and the colloid very rare.

Epithelioma.—Also known as cancroid, and as epithelial cancer.

It may be divided into two different forms:

1. Ulcerating, the so-called rodent or corroding ulcer.

2. Papillomatous, also known as cauliflower excrescence, vegetating epithelioma, and malignant papilloma.

These forms of cancer are distinguished by their development from the epithelium of the cervix, by

their comparatively tardy growth and systemic infection, and by their reappearance after removal at a relatively late period.

They consist of a connective-tissue stroma and many cells having the character of the epithelium of the cervix; the cells are contained within alveoli and show a tendency to arrange themselves in nests.

The ulcerating form develops usually upon the inner aspect of the cervix, and then extends in various directions; ulceration establishes itself early and is a marked feature; this form is of much rarer occurrence than the following variety.

The papillomatous variety usually develops from the vaginal aspect of the cervix, and most often grows toward the vagina. There is great hypertrophy of the cervical villi with their epithelial covering, and these villous formations are very vascular; after existing some time they also ulcerate. They must be differentiated from the non-malignant papillomata, which they resemble in appearance; a benign may change into a malignant papilloma; microscopic examination of the benign form shows no cancerous infiltration of the underlying substance of the cervix, as it does in the malignant variety.

Encephaloid or medullary cancer is found in the substance of the cervix, producing at first an infiltration and then ulceration. They are probably developed from the connective-tissue cells of the cervix; they progress and infect the system rapidly, and return comparatively soon after removal. They consist of a connective-tissue framework, in the meshes of which are cells in preponderating proportion; hence they are soft and ulcerate rapidly.

Scirrhus presents the same structures as the preceding

variety, but the cells are in comparatively small proportion, and hence the tumor is hard and resisting. Its progress is less rapid than the medullary form. We do not often meet with this variety, but it is probable that the medullary is developed from the scirrhus in a great many cases.

Colloid carcinomata are exceedingly rare, and consist of a connective-tissue stroma, the meshes of which are filled with cells and a peculiar colloid or mucoid material.

Though in the beginning we may distinguish these varieties, when ulceration has been produced this is no longer possible, and they then resemble each other.

After having begun, they regularly spread so as to invade more of the uterus, and also to neighboring organs and structures; these are most frequently affected by contiguous growth, and the bladder, vagina, ureters, tubes, ovaries, rectum, and peritoneum, and even the bones of the pelvis may thus become involved. Through ulceration of such carcinomatous deposits, fistulæ frequently result. Secondary deposits are also produced in the lymphatic glands and various viscera.

Symptoms.—During the early progress of the disease before ulceration has set in, there are often no symptoms, or only slight pain and hemorrhage. But soon the following are developed:

Hemorrhage. This is often the first symptom noticed; it is due to congestion of the mucous membrane near the tumor, the vascularity of the tumor itself, and to ulceration. It may at first be only menorrhagia, but soon more or less blood is lost constantly.

Watery discharge. Usually due to the transudation

of serum from a cauliflower growth; it is not at first offensive.

Pain in pelvic region, and tenderness on pressure or coition. These are not constant; pain is not due to involvement of the cervix; when present, it is either of a dull rodent, or of a sharp lancinating character; it may be peritonitic.

Offensive discharge.

Pruritus vulvæ and erosions. From contact with the irritating discharges, or from the constant escape of urine or feces through fistulous openings.

Constitutional symptoms of cancer. These are: emaciation, loss of strength, anæmia, the peculiar expression known as the cancerous facies, disturbances of appetite and digestion, peculiar straw color of the skin —the cancerous cachexia.

Symptoms due to extension of growth to bladder and rectum. The symptoms which may be thus produced are pain in micturition and defecation, and those due to the resulting urinary and fecal fistulæ.

Symptoms due to the existence of *complications;* these may be: Septicæmia (from absorption of the offensive discharges).

Hydronephrosis.

Uræmia.

Peritonitis.

Cellulitis.

Alarming hemorrhage.

Phlebitis, thrombosis, and embolism.

Tetanus.

Secondary deposits in lymphatic glands and viscera.

Physical Signs.—As advice is not usually sought until ulceration has become established, the physical

signs have then become well marked, and the diagnosis is readily made.

Before this stage, however, should a case present itself, it would be important to make the diagnosis, since if the case be one of cancer, the sooner removal is resorted to the better. At this stage, conditions complicated by induration and hypertrophy of the cervix would be most confusing. As an aid to diagnosis in such cases, Spiegelberg offered two tests: The mobility of the mucous membrane upon the underlying parts is lost in malignant cases, and by use of tents we find that in cancer the tissue remains hard and unyielding and does not become soft, as it does in benign induration. The first of these tests is difficult of application, and the second not absolutely distinctive; in cases of doubt it is justifiable to remove a small portion of the suspected mass, and subject it to microscopical examination.

Ordinarily, however, no difficulty in diagnosis is experienced. Upon vaginal examination we detect an ulcerating mass with ragged and brittle walls, easily bleeding, giving off an offensive odor, and of a peculiar, hard, resisting feel. The uterus is often bound down; the vagina and surrounding parts are frequently implicated, and fistulæ may be found as a result of this. Rectal examination may aid in the exact location of the tumor.

Should the slightest doubt exist, we can remove a small piece of the growth by the finger-nail, or curette, being careful not to excite too much hemorrhage, and examine it under the microscope; if cancer we will find a fibrous stroma with alveoli filled with epithelium-like and connective-tissue cells, not connected with the walls of the alveoli, and which can, therefore,

be brushed out; the existence of such microscopical peculiarities, together with the history, symptoms, and physical signs, will in all cases enable us to make a diagnosis.

Differential Diagnosis.—It may be confounded with:

Laceration of the cervix with hypertrophy and eversion.

Papillary erosion of the cervix with hypertrophy.

Chronic metritis affecting the cervix chiefly.

Syphilitic ulceration and condylomata.

Uterine fibroids.

Sloughing fibrous polypus.

Sarcoma of the cervix.

Retention of products of conception.

Diphtheritic inflammation.

The differentiation of the first three conditions has been given above.

Syphilitic ulceration and condylomata give a different history and are benefited by appropriate treatment. Uterine fibroids are more distinctly limited, and do not present implication of the surrounding tissues; whilst when in form of polypus ulcerating, this process is different from that of cancerous ulceration—the walls are firmer and less brittle. But these and the other affections enumerated above will be in most cases easily differentiated by a careful consideration of the history, symptoms, physical signs, and microscopical examination of the scrapings; in some cases we may have to make use of the test of time and whether they recur after removal.

Course and Prognosis.—The course is progressive and uniformly leads to death. A few cases of spontaneous cure have been reported, but even if no mistakes

were made in diagnosis, they are of extremely rare occurrence; practically, they do not influence the prognosis, which is absolutely unfavorable.

Causes of Death.—The immediate causes of death are:

Exhaustion.
Septicæmia.
Peritonitis.
Cellulitis.
Hydronephrosis.
Uræmia.
Hemorrhage.
Phlebitis, thrombosis, and embolism.
Secondary deposits.
Intercurrent diseases.

Duration varies from several months to seven or eight years; it is longer in epithelioma than in other varieties, and in general more protracted the less relative amount of cells is present. The average duration, if not interfered with, is probably two to two and a half years.

By surgical interference we can prolong life; the period of return of the growth depends upon the variety and the extent of infiltration of the growth; the most favorable cases are those in which the growth is an epithelioma, and operation is performed before much tissue is involved, and this tissue can all be removed.

The patient should be informed that the malady is a serious one, but, if possible, its exact nature should not be disclosed, on account of the mentally depressing effect which such a revelation always has.

Treatment.—May be symptomatic or surgical.

Symptomatic Treatment.—This is applicable and useful in those cases in which, from extensive implication, all the diseased structure cannot be removed.

(1) Attend to the general health by fresh air, exercise, proper hygiene so as to secure ventilation, etc.; tonics, such as iron, quinine, nux vomica, mineral acids, etc.; and especially cheerful surroundings. Should dyspeptic symptoms be present, these should be alleviated by the proper remedies. The diet should consist largely of milk, beef-tea, and eggs, and should be given in small quantities, frequently repeated. The bowels should be evacuated daily.

(2) Relieve pain by some form of opium given by the mouth, or in the form of suppositories or hypodermatically. Suppositories of iodoform are also useful for this purpose. The disease being incurable there is no objection to the formation of the opium habit; should opium lose its effect, twenty-grain doses of chloral hydrate may be employed.

(3) Counteract the effects of the offensive discharge by frequent vaginal irrigation with astringent and antiseptic solutions of alum, zinc, tannin, lead, permanganate of potassium, carbolic acid, thymol, etc. (strength about one per cent.). Suppositories of iodoform are also useful for this purpose. The vulva should be protected from the irritating discharges by the use of some ointment applied after each injection.

(4) Control hemorrhage by rest during the menstrual epoch, abstinence from coition, astringent solutions, or styptics, of which the subsulphate and the perchloride of iron are the best. If the hemorrhages are severe, ergot may be given by the mouth or hypodermatically, and the vagina tamponed, with or without the previous use of styptics. The use of caustics, cautery, and curette, so as to remove the superficial parts of the growth, is of decided benefit, and amongst the best means we have of controlling the hemorrhage.

There are no drugs having any influence over the development of cancer.

Surgical Treatment.—Though the treatment of the symptoms is important, yet we should always attempt to get rid of the disease by extirpation. A few cases of complete cure and of prolongation of life for many years, in cases in which the cancer was completely, or almost so, removed, although rare exceptions, would indicate that when the disease is recognized early, before it has spread beyond our control, we can at least prolong life by complete removal of the growth.

There are four operations for removal of cancer of the uterus.

1. Application of caustics.
2. Scraping out.
3. Amputation of the cervix.
4. Hysterectomy—extirpation of the uterus.

The first three of these are often advantageously combined in different ways; the choice between different operative procedures is governed in great part by the exact conditions presented in each case.

1. *Application of Caustics.*—The best are nitric acid, solution of bromine in alcohol (10 to 20 per cent.), and chloride of zinc. They produce a superficial slough, which often removes considerable of the cancerous material. It is a very efficient method of controlling hemorrhage; it is often used for this purpose, and also when the diseased portion, or any part of it, cannot be removed by more radical means.

To apply them, the parts should be dry, the caustic should be applied directly to the parts, and when nitric acid or bromine is used, irrigation should follow the application, to remove excess of caustic; chloride of

zinc is applied upon cotton pledgets and left in contact for twenty-four to forty-eight hours.

2. *Scraping Out.*—This procedure, also, is applicable for the control of hemorrhage, and to remove parts which cannot be removed by the knife or other means, either before or after the use of the latter. Simon's scoop is the instrument generally used; Sims's cutting curette may also be used. All the diseased tissue should be removed by firm and rapid strokes, it being easy to distinguish between the cancerous and the healthy uterine tissue. After this has been done, the scraped tissues should be seared by Paquelin's thermo-cautery at red heat; or it may now be possible to amputate the cervix, since the firm tissue now exposed is more easily operated upon.

3. *Amputation of the Cervix.*—This is to be resorted to in all cases when we see the disease before it has spread beyond this part. Even in other cases, we should endeavor to remove as much as possible of the diseased tissue, and, hence, amputation of the cervix is indicated, when possible. There are several methods by which this operation may be accomplished:

a. Galvano-cautery wire; when the disease appears to be limited to the cervix, and has not spread beyond the cervicovaginal junction, the galvano-cautery wire would be indicated. This is best used in Sims's position, the patient being anæsthetized; the wire is made to surround the cervix, and prevented from slipping, at the same time that the cervix is fixed, by the use of Thomas's forceps; by making traction whilst the heated iron is cutting through, amputation of the intravaginal portion of the cervix, together with a cone for the inner part above this, will result; should diseased tissue still remain, an attempt to remove this by

scraping with Simon's spoon should be made. After the operation, the vagina should be kept tamponed for ten days, to prevent hemorrhage.

b. The chain, or, better, the wire écraseur, may be used in the same way, but is not considered as desirable a procedure, on account of there being a greater liability to cut into the peritoneum.

c. When the tissues of the cervix are so brittle as to prevent our obtaining a hold with any instrument, we should first scrape off the softened portions, then remove the cervix by galvano-cautery wire up to the cervicovaginal junction, and above this by knife, scissors, or scoop; this is succeeded by vaginal tampons, as above explained.

d. Schröder's amputation of the vaginal portion of the cervix consists in dividing the cervix laterally, excising a wedge-shaped piece from each lip, stitching the anterior and posterior flaps together, and then closing the lateral incisions by sutures.

e. Schröder's supravaginal excision removes the entire cervix. An incision is made through the vagina in front of the anterior lip of the cervix, and the latter separated from the areolar tissue between it and the bladder; the posterior lip of the cervix being carried forward, a similar plan is followed posteriorly, but this is more difficult, and sometimes results in a wound of the peritoneum of the pouch of Douglas—in some cases this is inevitable, and is not of great importance. Then the cervix is separated laterally from the surrounding tissues; since large vessels enter here, they should be ligated. The cervix having been freed all around, the anterior cervical canal is cut into down to the canal, and the anterior wall of the vagina is stitched to the anterior cervical wall—in order to pre-

vent retraction. The posterior wall of the cervix is then divided, and the remaining part stitched to the posterior vaginal wall; the wounds laterally are also closed by sutures. Although the mortality from this operation is only about ten per cent., yet its results do not seem to be better than the simpler procedures above described.

4. *Hysterectomy—Extirpation of the entire Uterus.*—This may be accomplished by two different methods: (*a*) by abdominal incision, (*b*) through the vagina. These operations are only justifiable when the disease has not spread beyond the uterus, and thus the possibility of removing all the growth exists.

a. By Abdominal Incision (*Freund's Method*).—A median abdominal incision is made, the intestines drawn aside, the broad ligament including the tube, the ovarian and round ligaments, the ovarian and uterine arteries, and the pampiniform plexus, is carefully ligated on each side; the uterus is then excised by cutting through the utero-vesical and Douglas's pouches, the vaginal mucous membrane of the fornices, and the broad ligaments internal to the sutures, and the organ removed. The ends of the ligatures are passed through the opening in the vagina, the peritoneal wound closed, a T-shaped drainage-tube being kept in the wound, and then the abdominal wound is also closed. The mortality from this operation has been about seventy per cent., shock being a frequent cause of death.

(*b*) *Through the Vagina* (*Schröder's Method*).—The uterus having been drawn down forcibly to the vulva, the anterior vaginal fornix is incised, and the cervix separated thoroughly from the bladder; the posterior vault is then cut into, and the cervix freed

on all sides. Douglas's pouch is opened, and two fingers of the left hand passed into the abdominal cavity over the uterus into the utero-vesical pouch, and by cutting upon these fingers the peritoneum is divided anteriorly. The uterus is now retroverted and its fundus brought out through the wound in the posterior vaginal vault; this is difficult when the uterus is enlarged or the vagina small, and is facilitated by applying the forceps to the fundus. After the body of the uterus has been brought out at the vulva, the broad ligament is ligatured on each side; one ligature is applied *en masse*, and two others near this, one transfixing the upper, and the other the lower part of the broad ligament; this step is easy when ovaries and tubes are left behind, but difficult when these are removed, on account of the ease with which the ligature slips off. The uterus is then removed, and bleeding points in the pedicle ligated; the pedicles are brought into the wound, a T-shaped drainage-tube introduced, and the margins of the wound brought together without any attempt at exact coaptation. The vagina and end of the drainage-tube are packed with salicylated cotton, and the tube and sutures removed in two or three weeks. Should there be any elevation of temperature or offensive discharge, carbolized injections are resorted to. The mortality from this operation has been about twenty-seven per cent.—much lower than that after removal by the abdomen.

Cancer of the Body of the Uterus.

The preceding description of cancer of the cervix applies to a great extent to this condition of the fun-

dus; in the following lines the peculiarities only will be pointed out:

Cancer attacks the body of the uterus in only two per cent. of cases. The form is usually epithelioma, rarely encephaloid or scirrhus. The deposits occur either in the wall of the uterus, consisting at first of hard nodules, and extending either inward or outward, and then ulcerating, or the mucous membrane may be first involved, and a diffuse ulcerating mass result.

Cancer has been found to attack the body of the uterus at a uniformly later period (after menopause), and to occur in a comparatively larger number of cases of nulliparæ, than does that which involves the cervix.

Pain is a more uniform and an earlier symptom, and sometimes it is of spasmodic character; otherwise the symptoms resemble those of cancer of the cervix.

In examining physically: The cervix may be normal or also involved; the canal may be dilated. The uterus and its cavity are enlarged, and the organ presents a nodular or a diffuse hardness to the touch; it may be fixed by adhesions. Surrounding infiltration or fistulæ may be found. The uterine canal is also irregular, and bleeds easily; it can best be examined by dilatation of the cervix and introduction of the finger.

Differential diagnosis may be necessary from the various conditions enumerated in speaking of cancer of the cervix; but especially from retained placenta, sloughing submucous fibroid, uterine fungosities combined with chronic metritis, and peri-uterine cellulitis and peritonitis.

The course, prognosis, and treatment resemble those of cancer of the cervix; when the disease is limited to the body excision of the entire uterus is indicated.

Sarcoma of the Uterus.

Definition.—A form of malignant tumor of the uterus, formed on the type of young connective tissue, and consisting largely of cells.

Occurrence and Etiology.—It is a rare tumor of the uterus. Causes of its formation are unknown; it sometimes results from a previously existing fibroma. Most cases occur at a slightly earlier age, and in a relatively larger number of nulliparæ than does cancer.

Pathology.—It usually occurs in the body; rarely in the cervix. The tumor consists of connective tissue, cells, and bloodvessels, has no distinct capsule, and extends by continuous growth, less often by metastasis; it recurs after removal, but not so rapidly as does cancer. The cells which it contains are most often round and small, rarely spindle-shaped or giant-celled; the proportion of cells varies.

The malignancy of these tumors varies; it is greatest in those which are soft, succulent, and vascular—where the relative amount of cells and bloodvessels is great.

We find sarcoma often mixed with other types, and thus we may have fibrosarcoma, myosarcoma, myxosarcoma, and adenosarcoma of the uterus; they have also been known to become added to a pre-existing carcinoma.

The systemic implication and secondary deposits take place by means of the bloodvessels and not by the lymphatics, as is the case in cancer; the lymphatic glands are seldom involved, and secondary deposits are infrequent.

Clinically we may distinguish two forms:

1. *Diffuse sarcoma of the mucous membrane*, arising from the submucous areolar tissue; the mucous mem-

brane becomes soft and succulent, of a grayish-white color, may fill the entire uterus, and superficial ulceration may be added.

2. *Hard fibrous sarcoma*, arising in the muscular coat, and resembling small fibroids; this may either grow outward or inward.

Symptoms.—Hemorrhage, both during and between the menses; due to engorgement of the mucous membrane.

Usually absence of pain, though exceptionally pain and sometimes uterine tenesmus are present; the pain may be peritonitic.

Watery discharge; at first non-offensive or almost so; after a while it becomes offensive from admixture with ulcerative débris. It is white or pinkish in color.

Discharge of grayish-white shreds, "like particles of brain matter," which, upon microscopic examination, reveal the nature of the tumor.

Cachexia, not as marked nor as early as in cancer.

General depreciation of health, anæmia, dyspeptic symptoms, and loss of flesh and strength.

Symptoms due to involvement of bladder and rectum (if this occur), as in cancer.

Physical Signs.—We find a diffuse infiltration of a soft, succulent, and easily bleeding character, in one variety, and a sessile or polypoid, hard, and firm tumor in the other form.

The uterus is found enlarged; it is usually irregular; it may be fixed or movable. By the sound we find its cavity enlarged, and the use of this instrument causes profuse hemorrhage.

If the tumor project from the os, diagnosis is easy; if this does not occur, we should dilate the cervix, and examine digitally. We should subject some of the

discharge or scrapings to microscopical examination, the results of which are usually decisive.

Differential Diagnosis.—It may be confounded with:

Chronic endocervicitis.

Chronic metritis with fungosities.

Simple fibroid.

Carcinoma.

All of these may be differentiated by microscopic examination of the scrapings; we may have to keep the case under observation for a time, to determine positively; or we may have to see whether the tumor returns after removal.

Course and Prognosis.—Course is less rapid than that of cancer; the duration may be several years, and after removal its recurrence may not take place for several years. Hence the prognosis, though grave, for the disease is a fatal one, is better than in carcinoma.

Treatment.—Remove the tumor, even if any doubt of its malignancy exists, care being taken to avoid injury to healthy parts as far as possible, since the growth is said to have become engrafted upon freshly wounded surfaces.

Thorough scraping combined with the use of nitric acid down to the base of the tumor, may be sufficient: hysterectomy is indicated when the growth affects the parenchyma.

Adenoma of the Uterus.

This is an exceedingly rare neoplasm, belonging to the epithelial type, but in which the cells have a definite glandular disposition instead of the lawless arrangement as in cancer; it is due to hypertrophy of the

glands of the uterus. We often find an admixture in the form of adeno-sarcoma.

These tumors vary in malignancy; usually the only symptom of malignancy is recurrence after removal. They present the same symptoms and physical signs as do the soft diffused sarcomata. Treatment consists in dilating the cervix, thoroughly removing the mass with the sharp curette, and then applying nitric acid to the scraped surface.

Papilloma of the Uterus.

Definition.—A benign papillomatous or villous tumor, springing from the mucous membrane of the uterus.

Occurrence.—It is a rare form of new growth, and derives its chief interest from its being likely to be confounded with malignant tumors of a similar nature, and from the possibility of its becoming carcinomatous.

Etiology.—Irritation with gonorrhœal matter.

Non-specific irritation upon abraded surfaces.

Pathology.—We may distinguish two varieties:

1. Condylomata (venereal warts).
2. True papillomata.

They are formed by hypertrophy of the papillæ of the cervical mucous membrane, and hence their structure is similar to these papillæ—connective tissue, containing a loop of bloodvessels and covered by flattened epithelium; they may be single or compound.

The pathological distinction between these and the cauliflower excrescences of epitheliomata is the absence of infiltration into the parenchyma of the uterus; in the former

The venereal warts spring from the vaginal aspect of the cervix, are usually multiple, and are generally simply part of a similar growth upon the vagina and vulva.

True benign papillomata present usually single collections, arise from the cervical canal, and grow in the form of a polypus toward the vagina.

Symptoms.—Leucorrhœa.

Watery discharge.

Hemorrhage, which may be profuse.

Physical Signs.—Vaginal examination and inspection reveal the condition at once. A small, bright-red tumor of soft consistence is seen, resembling the malignant cauliflower excrescence, especially if it be the true papillomatous variety.

Differential Diagnosis.—It is important to distinguish them from the malignant form. This is done by noting that the mucous membrane is still movable upon the surrounding parts, that the benign form grows slowly, does not produce constitutional implication, and does not extend into the parenchyma of the uterus.

Course and Prognosis.—They often disappear spontaneously upon removal of the irritation which has caused their growth. They may, however, remain for some time, if not interfered with. The hemorrhage and serous discharge which they excite are often very debilitating. After thorough removal they do not recur. The possibility of transformation into carcinoma must not be forgotten.

Treatment.—Removal of the exciting cause; then removal of the tumor by scissors, ècraseur, or galvanocautery wire, and afterward cauterizing the stump with nitric acid or the cautery.

[For a considerable part of the above description of papilloma, the author is indebted to Schröder's article in Ziemssen's *Cyclopædia*, vol. x. p. 268.]

Uterine Moles.

Definition.—Moles are masses due to the retention and alteration of fœtal membranes or of the placenta. This is usually regarded as an obstetrical topic, but is considered in this work on account of it sometimes falling to the gynecologist's care and the importance of its differentiation from other growths of the uterus.

Occurrence.—Not very frequent.

Etiology.—We may distinguish between *true* and *false* moles. We shall discuss only true moles—those resulting from conception. Syphilis has been mentioned as an etiological factor, but nothing is really known of the causation.

False moles are growths occurring independently of impregnation, such as retained coagula of menstrual blood, membranous dysmenorrhœal casts, polypi, diphtheritic membrane, etc.

Varieties.—True moles may be divided into:

1. Carneous or fleshy.
2. Sanguineous.
3. Fatty.
4. Vesicular or hydatiform; also known as cystic degeneration of the chorion, hydatidiform pregnancy, and (incorrectly) as uterine hydatids.

Pathology.—All these varieties are due to changes taking place in the fœtal envelopes, when retained after death of the fœtus. They begin to be formed, in nearly all cases, before the third month of pregnancy. Some

authors believe that the death of the fœtus is secondary to the changes in the envelopes.

Usually, when the fœtus dies, abortion results; but sometimes the whole or part of the products of conception are retained; they then remain attached to the uterine wall, and receiving nourishment from it, undergo a certain perverted development and alteration.

The first three varieties are usually of small or moderate size; the vesicular form often acquires great bulk.

The carneous mole is so called on account of its resemblance to a fleshy mass; this is the result of its having undergone changes due to coagulation of blood and organization of the clot.

The sanguineous mole is one expelled soon after its formation, before it has had a chance to become changed into the carneous or the fatty mole.

The fatty mole is one resulting from fatty degeneration of the sanguineous or fleshy forms.

The vesicular mole consists of a mass of small pediculated bodies filled with a serous fluid; they have been likened to bunches of grapes or of currants. They are due to an abnormal and perverted growth of the chorionic villi after the death of the fœtus.

Symptoms.—Are usually more marked in the vesicular than in the other forms; in the latter, expulsion of the mass is sometimes the first and only symptom. Usually, however, all forms give the following symptoms:

Hemorrhage.

Feeling of weight in pelvic region.

Cessation of signs of pregnancy.

Slight constitutional disturbances, such as
Bad taste in mouth.
Nausea.
Headache.
Loss of appetite.
General malaise.
In addition to these, in the vesicular mole, we get
Discharge of clear or of sanguineous fluid.
Discharge of chorionic cysts.
Abnormal rapidity of uterine enlargement.

Physical Signs.—The uterus is found changed, usually to correspond to the second or third month of pregnancy. Should the cervix be dilated, exploration with the finger will often reveal the exact condition; should this not be the case, it should be dilated (being certain of the death of the fœtus), and the uterine cavity examined. Uterine moles are soft and spongy to the touch. A portion of the mass should be examined for chorionic villi, the finding of which is pathognomonic; these may be found in the discharge (vesicular form).

Differential Diagnosis.—This condition may be confounded with:

Pregnancy.
Uterine polypus.
Submucous fibroid.
Sarcoma of the body of the uterus.
Cancer of the body of the uterus.
Subinvolution.
Echinococcus of the uterus.

Most of these could be readily differentiated by the signs given. In echinococcus, we find the peculiar hooklets upon microscopical examination.

Prognosis.—Good.

Treatment.—Removal of the mass. The cervical canal should be dilated and ergot administered. Should this fail, the mass is to be removed by the fingers or even the hand in the uterus, care being taken in the vesicular variety not to perforate the uterine wall, since the cysts sometimes thin this out very much. The use of the scoop or of the placental forceps is less desirable. Should severe hemorrhage ensue during dilatation of the cervix, it is controlled by the vaginal tampon.

CHAPTER VII.

AFFECTIONS OF THE UTERUS (*concluded*).

Inflammations of the uterus—Acute endometritis—Chronic cervical endometritis—Chronic corporeal and general endometritis—Granular degeneration of the cervix—Cystic degeneration of the cervix—Fungous degeneration of the endometrium—Acute metritis—Chronic metritis—Atrophy of the uterus—Hypertrophy of the uterus—Hypertrophy of the cervix—Laceration of the cervix.

Inflammations of the Uterus.

These may be *classified* as follows:

1. Inflammation of the endometrium—*endometritis.*
   (1) Acute.
   (2) Chronic.
      (*a*) Of cervix.
      (*b*) Of body.
   (3) Accompaniments or forms of chronic inflammation of the endometrium:
      (*a*) Granular degeneration of the cervix.
      (*b*) Cystic degeneration of the cervix.
      (*c*) Fungoid degeneration of the endometrium.
2. Inflammation of the muscular coat—*metritis.*
   (1) Acute.
   (2) Chronic.
3. Inflammation of the peritoneal covering—*perimetritis.* This simply forms part of a pelvic peritonitis, and hence will be described under this affection.

Acute Endometritis.

DEFINITION.—An acute catarrhal inflammation of the lining membrane of the uterus, usually throughout its

entire extent, and not generally limited, as the chronic form often is, to either cervix or body.

Synonyms.—Acute uterine catarrh, acute internal metritis.

Occurrence.—Rather frequent; does not occur before puberty.

Etiology.—Direct injury by uterine sound or probe.
by pessaries.
by tents.
by intra-uterine applications.
by surgical operations.
by excessive coition.
Prolonged congestion from masturbation.
Prolonged congestion from excessive coition.
Suppression of menses.
Exposure to cold during menstruation.
Constitutional diseases—exanthemata.
Typhoid and typhus fever.
Puerperal fever.
Cholera.
Phosphorus poisoning.
Extension of neighboring inflammations.
Acute vaginitis, simple and specific.

Pathology.—The acute catarrhal inflammation usually involves the entire endometrium, but it may be limited to either cervix or body. The endometrium is at first swollen, softened, and hot, red, and the surface often spotted with small ecchymoses, and has very little secretion. In a few days there is excessive production of mucus, often mixed with pus and sometimes with blood. In severe cases there is an acute parenchymatous inflammation of the nearest muscular tissue.

Symptoms.—A certain amount of *constitutional dis-*

order, showing itself in slight fever, headache, anorexia, and general malaise.

Pain and heavy feeling in back, lower part of abdomen, pelvis, and neighboring parts.

Burning in vagina.

Vesical and rectal tenesmus.

Discharge; after a few days there is an excessive discharge of a viscid character, alkaline in reaction, sometimes tinged with blood, and often soon becoming mucopurulent.

Pruritus and excoriations upon and about vulva may be caused by this discharge.

Cessation of menses may occur.

Physical Signs.—Uterus is enlarged and tender, and the introduction of the probe causes hemorrhage; the sound should never be used on account of the great pain and hemorrhage which it produces. The cervix is found swollen, tender, reddened, and gaping, and showing the peculiar discharge already alluded to.

Differential Diagnosis.—From acute inflammations of surrounding structures—vagina, peritoneum, etc.—rarely is difficult.

Complications.—Vaginitis, vulvitis, pruritus, excoriations and eruptions upon vulva and surrounding parts; less frequently urethritis, cystitis, acute metritis, salpingitis, pelvic peritonitis and cellulitis, and general peritonitis.

Course and Prognosis.—It lasts usually four or five weeks, and then terminates in recovery, or continues in the chronic form. The prognosis is good, with ordinary care; rarely it may cause death by extension of the inflammation to the Fallopian tubes and peritoneum. In septic and traumatic cases the prognosis is very grave.

Treatment.—Rest in bed, fluid diet, opium to relieve pain and restlessness, and warm fomentations over the abdomen. If constipated, give castor oil or,

℞.—Ol. ricini,
Glycerinæ,
Aq. menth. pip., ... āā ℥ss.—M.
Sig.—At one dose.

or a saline cathartic. When the leucorrhœa is abundant, the vagina should be washed out several times a day with hot water, both for cleanliness and the desirable effect of the heat.

When the endometritis is the result of sepsis, the local employment of antiseptics is indicated—carbolic acid (℥ss–℥j to Oj), bichloride of mercury (1:2000–8000), or solutions of permanganate of potassium (℥ss–℥j to Oj).

Chronic Cervical Endometritis.

As already stated, chronic endometritis shows a tendency to limit itself to either body or cervix, and hence is subdivided into *chronic cervical* and *chronic corporeal* endometritis; there are, however, exceptions to this limitation.

Definition.—A chronic catarrhal inflammation of the mucous lining of the cervix uteri.

Synonyms.—Chronic cervical catarrh; cervical leucorrhœa; chronic endocervicitis.

Occurrence.—It is probably the most common of the diseases of the female generative organs; though usually considered of slight import, it is often the centre from which very grave changes start.

Etiology.—Like chronic catarrhs elsewhere, constitutional states enter largely into the etiology;

hence it is well to divide the causes into predisposing and exciting.

Predisposing Causes.—General debility and enervation due to:

Insufficient nourishment.
Excessive lactation.
Frequent parturition.
Physical or mental over-fatigue.
Anæmia.
Chlorosis and other blood diseases.
Other debilitating diseases, such as scrofula, tuberculosis, cancer, etc.
Convalescence from acute disorders.
Unknown causes.
Subinvolution.
Sedentary occupations.
Tight lacing and other pernicious habits of dress.

Exciting Causes.—Continuation of an acute endometritis.
Extension of a chronic corporeal endometritis.
Displacements of the uterus.
Intra-uterine pessaries.
Injury by incautious use of sound, tents, or therapeutic agents.
Efforts at producing abortion.
Cold-water injections after coition, to prevent conception.
Excessive coition.
Masturbation.
Obstructive dysmenorrhœa.
Laceration of the cervix.
Cervical polypi.
New growths in cervix.
Vaginitis, simple and specific.

Exposure to cold, especially at or near the menstrual period.

Parturition.

Retained products of conception, after abortion or labor.

Pathology.—Glands, stroma, epithelium, and bloodvessels are all involved, but in different degrees. The glands become hypertrophied and secrete thick tenacious mucus in excess; their mouths either remain normal or dilated, or very frequently are stopped up, and then ovula Nabothii and cysts are produced. The stroma is hypertrophied, giving rise to thickening in the membrane and sometimes eversion. The epithelium is shed in large amount, often producing superficial excoriations which may persist, and which may also be followed by hypertrophy of the villi, giving rise to the so-called granular degeneration of the cervix. The bloodvessels are often dilated.

Symptoms.—Leucorrhœa. This is a prominent symptom, and may be the only one. It constitutes a viscid fluid, clear or opaque, yellow, or sometimes stained with blood. It may excite inflammation of the vagina or vulva, or pruritus, excoriations, and eruptions upon neighboring parts.

Pain in back and loins, and feeling of weight in pelvis, increased on exercise.

Irregular menstruation; it may be increased or diminished in quantity or frequency.

Sterility; often caused by this disease.

Impairment of general health; this may not be present, and even when it occurs, varies very much; there may be diminished appetite, impaired digestion, nausea, languor, headache, nervous irritability, and anæmia.

Physical Signs.—The cervix feels large, soft, and velvety, tender to touch, and small nodules due to Nabothian follicles may often be felt. On employing the speculum a plug of tenacious mucus or muco-pus is seen projecting from the os; the margins of the latter may be reddened and velvety; the small elevations of Nabothian follicles are often noticed; there may also be small polypi, or granular and cystic degeneration, or erosions.

Differential Diagnosis.—From vaginitis—the use of the speculum decides this; or by washing out vagina and applying a tampon for several hours in front of the cervix, we can notice whether the discharge comes from the latter. From chronic corporeal endometritis, or that involving the entire uterus, the differentiation is not easy; the symptoms which point to involvement of the body of the uterus are: tenderness of the entire uterus as ascertained by the probe and bimanual manipulation, a rather thinner discharge and more constitutional disturbance.

Course and Prognosis.—It may end in spontaneous cure when slight, and when the predisposing cause is removed; but most cases are not thus favorable, and unless cured by active measures, go on indefinitely. In even the mildest cases, several months are required for complete cure. The mildest cases are those in which the secretion is small in amount and the disease has lasted but a short time.

Treatment.—1. *Removal of cause*, exciting and predisposing, if possible.

2. *General.*—Attention to the general health is of the greatest importance. The woman's condition should be improved by change of air, nourishing food, and tonics, such as iron, quinine, strychnine, arsenic,

mineral acids, etc. A moderate amount of non-violent open-air exercise should be indulged in, but too severe exercise, such as riding, is not advisable. No sexual indulgence should be permitted. Treat any symptoms which the patient may complain of, such as impaired digestion, nausea, constipation, etc., by their proper remedies.

3. *Local.*—Vaginal injections of simple warm water for fifteen minutes each night; to this warm water some mineral astringent, such as alum, zinc phosphate, copper sulphate, borax, boric acid, chlorate of potassium, or silver nitrate, ℥j to ℥ij to the pint, may be added.

In certain mild cases, this irrigation and proper constitutional treatment will suffice; but most cases of any duration require topical applications to the diseased endometrium. Previous to this, if the os externum be contracted, it is well to enlarge it by incisions or by dilatation with tents—this allows the discharge to escape more readily, and permits the more thorough use of local applications.

Before medicating locally, the cervical endometrium should be cleansed; if the discharge be not very tenacious, this can be accomplished by irrigating or by a piece of cotton upon a forceps or rubber stick; but usually this will not suffice, and a powerful long-nozzled rubber syringe must be used, and the plug removed by suction, or it may be entangled in the rough meshes of a small piece of dry sponge.

Having cleansed the diseased surface, applications are to be made to it by solutions, powders, or bougies. The solutions most frequently employed are: nitrate of silver 10 per cent., carbolic acid in glycerin 10 per cent., tannin in glycerin saturated, boro-glycerite 50 per cent., tincture and compound tincture of iodine.

Some of these are superficially caustic, but they act chiefly by tending to incite the membrane to healthy action; they are applied by brush or by cotton applied around a probe. The solids most frequently used are nitrate of silver, sulphate of copper, sulphate of iron, sulphate of zinc, alum, and bismuth. Nitrate of silver is best applied fused upon the end of a silver probe; the others are made into small cylinders two inches long, to which a string is attached, so that they can be removed when they become painful. These agents and also certain soothing drugs are also made up with butter of cocoa into small cylinders, and in this form introduced into the cervix and allowed to melt there. Or a piece of cotton may be saturated with any desired solution, have a string attached to it, be wound upon a Sims's probe and slide, introduced into the cervix, left there while the probe is withdrawn, and removed by means of the string when desired.

Tampons which have been soaked in glycerin, or glycerite of tannin, may be introduced after the local applications have been made and left *in situ* twenty-four hours. These often give great relief and aid in hastening a cure.

Scarification of the cervix also acts beneficially in some cases.

When all these means fail, it becomes necessary to destroy or remove the diseased mucous glands. Fuming nitric acid and a saturated solution of chromic acid are best and most often used; they are applied by means of a roll of cotton upon a probe, the vagina being then irrigated and a glycerin-saturated wad of cotton, renewable daily, applied for about ten days, when the slough will come away; the exposed surface should then be painted with a 5 per cent. solution of

silver nitrate every few days; it may be necessary to scarify in order to expose the more deep-seated follicles previous to the application of the caustic. Potassa fusa and the actual cautery have been used, but it is claimed they produce considerable cicatricial contraction.

In the most obstinate cases the glands must be removed by the sharp curette in one or two sittings. In these cases Schröder advises removal of the diseased mucous membrane with the knife, and applying in its place flaps from the vaginal aspect of the cervix.

Chronic Corporeal and Chronic General Endometritis.

Definition.—A chronic catarrhal inflammation involving the lining membrane of the body of the uterus, or of the entire uterus. Most authorities agree that limitation to the body is not near as frequent as is that to the cervix; but considerable difference of opinion exists as to whether involvement of the body alone, or of both body and cervix combined, is the more frequent. Thomas believes the former to be the more common.

Synonyms.—Uterine catarrh, catarrh of the uterus, blenorrhœa of the uterus, uterine leucorrhœa, internal metritis.

Etiology.—Both the predisposing and the exciting causes are the same as those of chronic endocervicitis.

Pathology.—This depends upon the duration of the disease.

In cases of short duration, the endometrium is swollen, soft, and may be discolored from extravasations of blood, smooth or covered by granulations forming villous or polypoid masses; there is hyperse-

cretion of a thin alkaline fluid, clear and white, or turbid and colored from admixture of pus or blood.

In the older cases, the mucous membrane becomes thin, of a pale slate color, and devoid of its normal epithelium; the latter having been thrown off, is replaced by a layer of the squamous variety, so that the endometrium finally looks like connective tissue. The glands are atrophied, many of them destroyed, and others the seat of cystic distention. Small mucous polypi may be found. The uterine cavity may be enlarged.

If the inflammation also involve the cervix, the changes found in chronic endocervicitis will also be present.

Symptoms.—These are similar to those of the cervical variety.

Leucorrhœa; thin, watery, alkaline, clear and white, or yellow or reddish from admixture of pus or blood. It is glairy, like starch-water; it is neither as viscid, tenacious, nor thick as that from the cervix; the quantity is always increased after menstruation.

As a direct local result of the discharge, we may have the affections already mentioned.

Menstrual disorders: menorrhagia is often present and may constitute a serious symptom; dysmenorrhœa is frequently observed, and it may be of the membranous variety.

Pain or a tired feeling in the back and pelvis is often complained of.

Interference with the general health is commonly present to a greater or less degree; these symptoms may be referred, in the first place, to the nervous system—headache, neuralgias, mental depression, languor, and nervous irritability; and, secondly, to the digestive

apparatus—diminished appetite, impaired digestion, nausea, and vomiting, tympanites, and constipation.

Anæmia and its symptoms.

Sterility is a common effect.

Abortion frequently results.

Although all these symptoms may be well marked in some of the severe cases, yet many cases have only a very few symptoms and go on for many years without seeking medical advice; others complain of positively nothing excepting the leucorrhœa.

Physical Signs.—If the cervix be implicated, we have the physical signs due to this, and then the diagnosis of the corporeal disease is difficult. Even when the inflammation is confined to the body, the signs are not very reliable. They are:

Patulousness of os internum.

Increased length of uterus and its cavity.

Increased sensitiveness of the uterus.

Irregularities of the endometrium discovered by probe.

Peculiar discharge (especially if cervix be healthy).

Differential Diagnosis.—From endocervicitis, vaginitis, retained products of conception, and commencing malignant disease. The speculum and blunt curette for scraping, with subsequent microscopical examination, are the best means.

Complications.—Endocervicitis, vaginitis, vulvitis, pruritus, excoriations and eruptions upon or around vulva, chronic metritis, uterine displacements, hydrometra, pyometra.

Prognosis and Course.—In recent cases the prognosis of cure is only fair; in old cases cure is the exception, but amelioration can often be effected. It does not endanger life, but occasionally hemorrhage

may be a serious symptom. The prognosis is most favorable in those cases in which the disease is recent, patient's health good, age near menopause, and the local changes already produced slight.

The course is usually protracted—months or years. Conception, if it goes on to term, often effects a cure.

TREATMENT.—1. *Removal of* the predisposing and the exciting *causes.*

2. *Attention to the general health;* these two indications are very important.

3. *Local Measures.*—These comprise curetting, swabbing, ointments, bougies, and injections.

Curetting is especially indicated when fungoid cystic, or polypoid degeneration exists, but is also serviceable in other cases, probably by inciting the diseased surface to healthy action. Thomas's blunt wire curette should be used gently, with the aid of the speculum, and the woman kept quiet in bed for some time after its employment. It is contra-indicated when perimetric inflammation exists. It is highly recommended, since, used with these precautions, it is usually devoid of danger, and is productive of good results in many cases.

Swabbing out the uterus with a piece of medicated cotton wound upon a probe, or with a brush, the cervix being protected by the cervical speculum, and the uterine cavity previously cleansed, is occasionally of service; but it is not in general use, since the proceeding is attended with some danger. The solutions which have thus been employed are: Chromic acid, 10 per cent.; carbolic acid, 5 per cent.; nitrate of silver, 5 to 10 per cent.; tincture of iodine, sulphate of copper, zinc, and aluminium, in saturated solutions; solution of persulphate or chloride of iron, 25 to 50 per cent., etc.

Ointments are rarely employed; a special syringe is necessary for their deposition into the uterine cavity, where they gradually melt, their running into the vagina being prevented by tampons. These ointments are medicated with the drugs enumerated in speaking of swabbing.

Bougies and pencils may be soluble or insoluble. Pencils of diluted silver nitrate, zinc, alum, or copper have been used. Or bougies made of gelatin or cocoa-butter and similarly medicated, may be employed. Or cotton rolled into the form of a cylinder and medicated, may be left in the uterine cavity for a day or two, and then removed by a string previously attached. All these proceedings are, however, accompanied by some risk, and their benefits so doubtful, that they are not in general use.

Intra-uterine Injections.—These have been followed by good results in the hands of some, but their use has been followed in so many instances by disastrous results, that they should certainly not be employed by any except those skilled in uterine therapeutics; even then certain precautions must be observed, for even under the most favorable circumstances fatal results have ensued. Hence, although largely used in France and Germany, they are generally condemned as a means of treating endometritis in the non-puerperal uterus by gynecologists in England and in this country.

The manner of using and the precautions necessary are as follows: A syringe with a long sound-like nozzle and a small graduated barrel is used; the fluid must be warm; no air must be in the syringe; not more than several drops of a weak solution of the drugs mentioned as used for swabbing should be injected; no force must be employed; the cervix is exposed by speculum, and

dilated so as to allow the ready reflux of the fluid; or a double-current nozzle can be used (but even here the cervix can be dilated, since the return opening may become stopped up by mucus or blood); the uterus is washed out previously with simple warm water, the woman is kept in bed for a day or two afterward. Even with all these precautions this operation is attended with the following risks: Uterine colic, pelvic peritonitis, general peritonitis, pelvic cellulitis, sudden entrance of air into veins, shock, and collapse.

Granular Degeneration of the Cervix.

Definition.—A granular condition of the mucous coat of the cervix, already alluded to in connection with chronic endocervicitis, of which condition it frequently forms part; it is usually merely concomitant to inflammations of the parenchyma of the uterus and the endometrium. It is usually described with the lesions of chronic cervical endometritis; Thomas describes it separately.

Synonyms.—It is often improperly called cervical erosion and ulcer. It has also been called "catarrhal patches," varicose and bleeding ulcer, and cock's-comb granulations.

Etiology.—Same as that of chronic endocervicitis; it is directly produced by friction, irritating discharges, and uterine congestion.

Pathology.—There is desquamation of the epithelium and a replacement of this by highly vascular villous processes of new formation.

Symptoms.—Those of chronic cervical endometritis; there exists, however, more tendency to bloody leucorrhœa, menorrhagia, and metrorrhagia.

Physical Signs.—The cervix feels soft, velvety, and

granular; upon using the speculum, we see a reddened, highly vascular patch of variable size, usually situated near the external os, and resembling the tissue of granular lids.

DIFFERENTIAL DIAGNOSIS.—From cervical laceration, which it resembles and often complicates.

COURSE AND PROGNOSIS like those of chronic endocervicitis.

TREATMENT is also that of this affection, the same attention being needed in regard to the condition of the general health, and the removal, if possible, of all causes and complicating conditions (especially displacements and lacerated cervix).

Locally.—(1) Free vaginal injections for fifteen minutes twice a day; for this purpose we may use warm water, plain or medicated with astringents.

(2) Applications of stimulating and irritating fluids and solids.

(3) Suppositories of astringents (alum, iodide of lead, tannin, zinc, etc.); these are introduced high up; they are often combined with opium or belladonna if pain exists.

(4) Removal of granulations by curette or scissors.

(5) Removal of granulations by fuming nitric acid or by chromic acid.

The last two proceedings are highly spoken of, especially curetting.

(6) Scarification.

(7) Puncture.

Cystic or Follicular Degeneration of the Cervix Uteri.

DEFINITION.—Like the preceding, this is a condition usually found with chronic endocervicitis, in connection with which it has been spoken of.

Pathology.—The condition is due to the closure of the openings of the cervical mucous glands and a retention of their secretion, causing distention with a honey-like fluid. They may open spontaneously, and thus look depressed; or, after opening, there may be added hypertrophy of the papillæ which are sometimes seen within their margins, giving rise to angry-looking red elevations.

Etiology, Symptoms, Course, and Prognosis are similar to those of chronic endocervicitis.

Physical Signs.—A number of elevations, varying in size from a pin's head to a cherry-pit, or larger, are felt upon the cervix, and by speculum are readily perceived as small, elevated, angry-looking nodules.

Treatment.—Similar to that of chronic endocervicitis: in addition, we must evacuate the contents of the cysts and cauterize their cavities by silver, nitric or chromic acid, acid nitrate of mercury, or the actual cautery. Or the curette may be used, employing considerable force, and thus rupturing the cysts. When everything has been tried repeatedly, and the case is extensive and intractable, removal of the diseased part by knife, scissors, écraseur, or galvano-caustic wire may become necessary.

Fungoid Degeneration of the Endometrium.

Definition.—A condition of the endometrium, changed by the projection of fungous masses of highly vascular hypertrophies of the mucous membrane. It is really a form of chronic endometritis.

Synonyms.—Uterine fungosities; granular endometritis; internal villous metritis; hyperplastic or polypoid metritis.

Occurrence.—It is of frequent occurrence; it is seen at any age after puberty, but is most frequent in the middle-aged.

Etiology.—The most frequent causes are:

Abortion.

Parturition.

Retention of products of conception.

Subinvolution.

Chronic endometritis.

Chronic metritis.

Lacerated cervix.

Uterine displacements.

Uterine fibroids.

Pathology.—These masses consist, according to Delafield, "of hypertrophied elements of the mucous membrane, dilated follicles, enlarged bloodvessels, and exaggerated cell growth" (Thomas). Sometimes these are mixed with portions of retained products of conception.

Symptoms.—Menorrhagia.

Metrorrhagia.

Leucorrhœa.

Sterility.

Constitutional effects of exsanguination, consisting of anæmia and its symptoms.

These may be altered by the existence of the numerous complicating conditions mentioned under Etiology.

Physical Signs.—The cervical canal is patulous and through it we can often feel the soft spongy endometrium. The diagnosis can be made by introducing a dull wire curette (Thomas's), and feeling the uneven surface of the endometrium and scraping away the villosites. The material scraped away appears to the

naked eye as thickened, softened, hyperplastic mucosa, or polypoid growths resembling placental villosities. A positive diagnosis is made by examining the tissue scraped away under the microscope; this will serve to differentiate them from carcinoma, sarcoma, and retained products of conception. The uterus may be changed by complicating affections.

Course and Prognosis.—Though occasionally cured spontaneously, by parturition and menopause, usually the disease continues indefinitely, the condition either remaining stationary or advancing. With proper treatment, however, prognosis is good and recovery certain.

Treatment.—Scraping the entire uterine mucous membrane with Thomas's wire curette, a firm pressure being exerted; the woman should be kept in bed for two or three days afterward. This may have to be repeated several times, and, in addition, in obstinate cases, applications of tincture of iodine or of nitric acid to the uterine cavity be required. In rare cases, Sims's sharp curette, or Emmet's curette forceps, by which the growths are seized and thus removed.

This treatment, especially if the wire curette be used, and the woman kept quiet after the proceeding, will rarely be followed by undesirable consequences.

Acute Metritis.

Definition.—An acute inflammation of the muscular substance of the uterus.

Occurrence.—The occurrence of this disease, except during the puerperal condition, is rare; at all times it is usually accompanied by more or less implication of the endometrium and of the peritoneum.

Synonyms.—Acute inflammation of the uterus; acute parenchymatous metritis.

Etiology.—Most frequently (1) puerperal septicæmia.

Rarely (2) exposure to cold during menses.

(3) Gonorrhœal infection.

(4) Excessive coition.

More frequently (5) traumatism of some form; injury by sound, curette, tents, intra-uterine pessaries, or intra-uterine medication, especially injections.

(6) Attempts at abortion.

(7) Operations.

Pathology.—The uterus is enlarged, soft, and congested. Its muscular substance is infiltrated with serum and pus, and the latter may be diffuse or circumscribed; when circumscribed, a small abscess results, which may break into the cavity of the uterus, or into bladder, rectum, small intestine, or peritoneum, or through abdominal walls—adhesions having taken place. There is usually an accompanying inflammation of the endometrium and of the peritoneum covering the uterus.

Symptoms.—*a. Constitutional.*—Rigors.

Fever.

Rapid and feeble pulse.

Rapid and shallow respiration.

Nausea and vomiting.

Prostration.

Diarrhœa or constipation.

b. Local.—Pain, fulness, and weight in pelvis.

Tenderness over hypogastrium.

Discharge, due to complicating endometritis.

Thus the symptoms resemble those of peritonitis, which is usually present as a complication.

Physical Signs.—Tenderness over hypogastrium; vagina hot and dry; uterus enlarged, very tender, and bleeds easily.

Complications.—Any of the surrounding organs or parts may become implicated.

Course and Prognosis.—Course is acute; the symptoms last from a week to ten days, when most often the patient dies; but she may recover completely, or with the formation of abscess, or the acute may be followed by the chronic form.

Treatment.—If occurring during the puerperium, wash out the cavity of the uterus with 1 to 40 carbolic acid or 1 to 2000 bichloride of mercury. Even in non-puerperal but septic cases this is advisable.

The patient should be kept absolutely quiet; fluid diet; urine drawn if necessary; bowels moved at first, if necessary, by gentle enema, and the cardiac feebleness combated by alcoholic and ammonic stimulants. Pain should be relieved by opium, and the application of warm poultices or turpentine stupes to the hypogastrium. If much fever be present, quinine or antipyrin in ten- to twenty-grain doses is useful, or the abdominal ice-water coil may be used.

Chronic Metritis.

Definition.—A chronic inflammation of the parenchyma of the uterus, resulting in an interstitial production of new connective tissue, accompanied by congestion and nervous hyperæsthesia.

Synonyms.—Areolar hyperplasia; chronic parenchymatous metritis; diffuse proliferation of the connective tissue of the uterus; diffuse interstitial hypertrophy; diffuse interstitial metritis; sclerosis uteri; cirrhosis of

the uterus; hyperplasia of the fibro-muscular tissue of the uterus; infarction of the uterus; subinvolution of the uterus (when occurring after parturition).

Occurrence.—Chronic metritis is considered by many the most frequent disease of woman; it is certainly of very frequent occurrence. Since most cases are examples of subinvolution or the results thereof, the disease is very much more common in multiparous than in nulliparous women—it is comparatively rare in the latter; it is also more common in the married than in virgins.

Cases in which the cervix is principally involved are more common than those in which the body or the entire uterus is affected.

Etiology.—There are both predisposing and exciting causes.

1. *Predisposing Causes.*—(Both in multiparæ and nulliparæ.)

General depreciation of health.

Tuberculous and scrofulous diathesis.

Blood diseases, such as anæmia, chlorosis, etc.

Frequent parturition or abortion.

2. *Exciting Causes.*—These may be grouped as follows:

First, causes which produce subinvolution.

Second, causes which produce active congestion and neighboring inflammation or irritation.

Third, causes which produce passive congestion or venous stasis.

(*a*) *Subinvolution.*—The causes of which are:

Careless or improper management of the third stage of labor.

Rising too soon after delivery.

Severe exercise too soon after delivery.

Coition too soon after delivery.

Retention of portions of placenta, membranes, or blood-clots in uterus.

Laceration of the cervix.

Non-lactation.

Puerperal pelvic inflammation.

The occurrence of any disease during post-partum convalescence.

Post-partum hemorrhage.

Repeated abortions.

Subinvolution means deficient involution. During gestation there is a decided physiological hypertrophy of all the uterine tissues, and after delivery a physiological atrophy, produced by fatty degeneration and absorption, takes place; this is known as involution, and usually requires six to eight weeks for its completion. When, from any cause, the uterus is left in the condition of subinvolution, it has partly acquired the lesions of chronic metritis—no differentiation during life is possible; after a while further changes are added, by which the organ finally assumes a condition identical with that which is the seat of chronic metritis from non-puerperal causes.

(*b*) *By causing active congestion, or neighboring inflammation, or congestion.*

Endometritis.

Acute metritis.

Perimetric inflammations.

Free use of caustics.

Excessive coition.

Masturbation.

Exposure at time of menstruation.

Gonorrhœa.

(*c*) *By causing venous congestion or stasis.*

Uterine displacements.

Habitual constipation.

Habitual distention of bladder.

Errors in dress.

Tumors of uterus or neighboring parts.

Abdominal tumors pressing upon ascending vena cava.

Diseases of liver and heart, and pulmonary emphysema.

Pathology.—There are three stages: 1st, hyperæmia; 2d, hyperplasia; 3d, sclerosis. At first the uterus is enlarged, congested, and soft; this enlargement is due, partly to congestion, partly to an interstitial development of new connective tissue rich in cells. The muscular fibres may be normal in size and amount, or slightly increased.

After the disease has lasted some time, by the continued increase of this diffuse connective tissue (by its contraction, according to some authors), the blood-vessels are compressed, and the organ now becomes anæmic, hard, increased in size, or more rarely remains of normal or becomes even smaller in size.

With this, there is often endometritis.

These changes may affect the whole uterus, or be limited chiefly to the cervix, or chiefly to the body of the organ.

Symptoms.—The commencement of symptoms is in most cases referred to the end of some confinement.

Weakness in back and limbs.

Pain in back.

Heavy feeling in pelvis.

Leucorrhœa.

Dyspareunia.

Disordered menstruation.

Constipation.
Tendency to abortion.
Depreciation in general health.
In the more severe cases there may be in addition :
Darkening of the mammary areolæ.
Mammary neuralgia.
Rectal tenesmus.
Hemorrhoids.
Vesical tenesmus.
More marked depreciation of the general health, showing itself by nervous and dyspeptic symptoms.

Though this array of symptoms is given, yet it will be observed that none of them is pathognomonic, and all of them occur with other diseases peculiar to women; many of them are due to existing complications, rather than to the disease itself. Some women have so few symptoms that they do not seek advice; others are troubled only at the menstrual epoch; but a great many have sufficient suffering caused by this affection to render them miserable and chronic invalids.

Physical Signs.—The uterus is found enlarged and tender, and its cavity elongated and roomy; these peculiarities may be confined to the body, or to the cervix, or affect the entire organ. The cervix is large, soft, or later hard, and the external os often gaping. The physical signs are, of course, modified by the complicating conditions so frequently coexisting.

Differential Diagnosis.—From early pregnancy, uterine fibroids, carcinoma of the cervix, and perimetric inflammations.

From pregnancy during the first month or two it may be difficult to differentiate—the most reliable dif-

ferences are absence of menstruation, absence of tenderness on pressure upon uterus, cervix rather softer, and vulva and vagina are more congested in pregnancy.

Uterine fibroids are diagnosticated by the probe, sound, bimanual and rectal touch, and dilatation of the cervical canal, if necessary.

Perimetric inflammations can generally be differentiated readily by the abundance and severity of symptoms, and the immobility of the uterus.

Carcinoma of the uterus in its early stages may be difficult to distinguish from a cervix enlarged and hardened by this affection. Usually the following characteristics of carcinoma will decide: Cachexia, more constitutional debility, tendency to hemorrhage, no previous soft condition, feels harder, like cartilage, rarely invades body of uterus, and is not softened by the use of the sponge tent.

Complications. — These are numerous, and may have preceded, developed simultaneously, or followed the chronic metritis. They are: Displacements, laceration of the cervix, endometritis, vaginitis, cystitis, cystic and granular degeneration of the cervix, uterine fungosities, perimetric inflammations, salpingitis, ovaritis, menstrual disorders, hysteria, etc.

Course and Prognosis.—Course is very lengthy, even under the most favorable circumstances. The process shows a progressive tendency, unless treated. With no plan of treatment can we effect a cure—the condition of the uterus is almost always a permanent one. But although we cannot remove the lesion, we can accomplish what practically amounts to a cure—free the woman from all annoying symptoms. The prognosis is best in those cases in which the cervix

alone is implicated; it is very much dependent upon whether treatment is faithfully and persistently carried out by the patient. The menopause rarely effects a spontaneous cure of symptoms. A successful impregnation and parturition do not usually improve the patient's condition.

Treatment.—1. *Remove existing complications*, if possible; such as displacements, laceration of the cervix, etc. This alone may render the woman comfortable.

2. *General Treatment.*—Improve the general health as much as possible. Plain nourishing diet, change of air and surroundings by a stay at the seashore or any pleasant country site, a sea voyage, or a trip to one of the European watering places, and baths, will be of benefit; tonics are of service, and ergot is valuable in recent cases. If anæmic, ferruginous preparations, and tonics are indicated. The bowels and bladder should be emptied regularly by the observance of a regular time for these duties. If a cathartic be necessary, the saline mineral waters are the best. A moderate amount of gentle exercise in the open air is of benefit.

3. *Uterine Rest and Freedom.*—No violent exercise should be indulged in; on the other hand, the woman should not be in bed or on the lounge all day, on account of the bad effect on the health and spirits which this has. An hour or so should be spent in the open air daily. No sexual intercourse, or only a very infrequent indulgence, should be permitted. Uterine displacements should be remedied by pessaries, and all weight removed by skirt-supporters, abdominal bandages, and the avoidance of tightly laced corsets. Dr. Weir Mitchell's plan of combining complete rest with frequent administration of animal foods, and the ap-

plication of massage, passive exercise, and electricity, acts well very often.

4. *Direct Local Measures.—a. Massage* to the abdominal muscles, and directly to the uterus from the exterior when very large, and by vagino-abdominal manipulation when of small size, has been used of late, and is of considerable efficiency in cases of not too long standing.

b. Depletion from cervix, if it be enlarged and tender, is often useful. It can be accomplished by leeching, scarification, puncturing, and cupping. It is best done, very often, at the menstrual period, especially if amenorrhœa be present. Only one or two tablespoonfuls of blood should be taken at each sitting, and the operation may be repeated in three or four days.

In using leeches, the cervix is filled with cotton, exposed, enclosed in a cylindrical speculum, cleansed, punctured in several spots, and three or four leeches applied; these are removed when they cease sucking; the woman should then be kept quiet for a day or two.

In scarifying, a sharp, narrow bistoury is introduced into the cervix, and caused to make a number of superficial incisions in withdrawal.

In puncturing, an ordinary needle, or a spear-pointed knife is plunged into the cervix for about a twelfth of an inch, rotated and withdrawn; three or four punctures usually suffice.

In cupping, a hard-rubber cylinder with piston is introduced through a speculum, applied to the cervix, the piston withdrawn, and thus blood drawn to the surface, and then let out by punctures.

c. Vaginal injections of very hot water for fifteen minutes free use twice a day, are of decided benefit.

d. Iodine and Glycerin.—The compound tincture is

often painted over the cervix in several layers, and followed by a tampon of cotton saturated with glycerin applied against cervix; this is repeated once a week, is largely used, and often effective.

e. Vesication by collodium cum cantharide, several coats being applied and the vagina washed out with water afterward, followed by rest in bed for three or four days, is occasionally used; nitrate of silver may be used in the same way.

f. Amputation of the Cervix; Partial or Complete—Amputation of one lip of the cervix, as advocated by Dr. Martin, of Berlin, is recommended by certain German authorities in cases in which there is marked hypertrophy of this part of the uterus with laceration; in this country, trachelorrhaphy is usually preferred in these cases.

Amputation of the entire cervix is sometimes resorted to when there is marked hyperplasia of this part. In both the complete and partial amputation, the operation induces a sort of involution, and a consequent diminution in size of the entire uterus.

Amputation of the Cervix Uteri.

Indications.—Great cervical hyperplasia.

Malignant disease.

Longitudinal cervical hypertrophy.

Conical projecting cervix.

Intractable granular and cystic degeneration of the cervix.

Operation.—A small part only, or the entire cervix may be removed.

The operation may be done by knife or scissors, by écraseur or wire, or by galvano-cautery. Of these

means, removal by a wire, made red hot after being in place, by electricity, is the most desirable.

1. *By Knife or Scissors.*—Sims's position and speculum; the cervix is first slit on each side, and then each lip seized and cut off; or it may be cut off circularly. The stump can be allowed to granulate, or treated by Dr. Sims's method; the latter consists in drawing down the mucous membrane on each side, and with it covering the stump. Or Hegar's method may be used, of stitching the vaginal mucous membrane to the cervical. Simon and Marckwald's plan of amputation is to remove a wedge-shaped piece from each lip of the cervix, and stitching the vaginal to the cervical mucous membrane on each lip. During amputation by knife or scissors, hemorrhage is controlled by a constriction band above the point of section, and by the sutures.

2. *Écraseur.*—If the cervix be within easy reach, the dorsal, if not, Sims's position is used. The chain is applied and made to cut directly and slowly, care being taken not to wound the peritoneum or the bladder. Maisonneuve's wire écraseur is thought to be preferable to the chain instrument.

3. *Galvano-cautery.*—A loop of wire is engaged around the cervix at the desired point, the woman being in the dorsal or Sims's position; the loop is tightened so as not to slip, and a current of electricity made to pass through it so as to produce a red heat, thus causing the loop to cut through the tissue as it is being tightened by a screw turned by the operator. After this method of operating, although primary hemorrhage is controlled, we must be on the lookout for secondary hemorrhage, and to avoid this use tampons and careful watching during convalescence.

Prognosis.—Recovery after operation is the rule, very few deaths occurring; the dangers are from primary and second hemorrhage, peritonitis, cellulitis, atresia, and tetanus.

Atrophy of the Uterus.

Atrophy of the whole uterus, or of the cervix only, may occur under five different conditions:

1. Congenital.
2. Constitutional, when associated with certain enfeebled states, as in tuberculosis, scrofula, chlorosis, paraplegia, etc.; it is questioned whether these cases are not really congenital.
3. Superinvolution of the pregnant uterus.
4. Senility after the menopause.
5. Complicating tumors of the uterus; rare, for usually the reverse takes place.

The senile variety is physiological, that complicating uterine tumors simply forms part of the pathology of these. The other varieties have their chief interest in the production of *amenorrhœa*, under which head they will be discussed.

Hypertrophy of the Entire Uterus.

An enlargement of the entire uterus without any primary inflammatory action (excepting the physiological form of pregnancy) is exceedingly rare. An equable increase in the number and size of all its constituent parts has been reported as occurring with distention of the uterus in atresia, with tumors of the uterus, and has been found in a few cases occurring in prostitutes. It gives rise to no symptoms, unless some complicating condition, such as displacement, exists.

Hypertrophy of the Cervix Uteri.

This condition, disassociated from inflammation, is rare. It may be divided into hypertrophy of the *infravaginal* and of the *supravaginal* portions; by French and German authors, a third subdivision is added—hypertrophy of the intermediate portion of the cervix, the part extending from the level of the vaginal attachment in front, to the level of this attachment behind.

The etiology, when not congenital, is unknown; the intermediate and supravaginal varieties are frequently associated with prolapsus uteri.

The symptoms of all three varieties resembles those of uterine prolapse; the diagnosis is easy; the treatment consists in amputation of the cervix (vide p. 228).

Laceration of the Cervix.

Definition.—A solution of continuity of the cervix, varying in depth, produced during labor.

The recognition of the significance of this lesion, and the operation for its cure, are advances in gynecology of late years, and are credited to Dr. T. A. Emmet.

Varieties.—They vary in extent, form, and seat.

a. In extent; they may be partial or complete; the external coat of the cervix is intact in the former, the entire cervix being torn through in the latter case.

b. In form; the laceration may be single or unilateral, double or bilateral, multiple or stellate.

c. In seat; they are most common in front and to the left side of the cervix, but may occur at other parts; the fœtal head most often engaging in the right oblique diameter, and the occiput pointing in front and to the left, may explain this frequency.

Occurrence.—A laceration of the cervix is found in about thirty per cent. of parous women. It is probable that the first labor always produces some laceration; but many of these are so slight that they heal up entirely, whilst others heal up partially, and give rise to no pathological consequences, and, hence, no symptoms; a great many, however, lead to important changes, and are of great significance in the production of uterine disease. Emmet believes half the ailments of parous women can be attributed to this condition.

Etiology.—There may be positively no discoverable cause except a natural labor; but in other cases, the following causes will have existed:

Unnatural labor—Precipitate labor.
Tedious labor (more commonly than precipitate).
Abnormal presentations.
Instrumental delivery.
Version.
Too early evacuation of the liquor amnii.
Criminal abortion.
Unnatural conditions of the cervix—Rigidity.
Carcinoma.
Previous laceration and cicatrization.

Pathology.—Simply a tear extending a variable depth or entirely through the cervix; there are often added as:

Resulting Lesions.—Chronic endocervicitis.
Granular and cystic degeneration of the cervix.
Eversion or ectropion of the lips of the cervix.
Hypertrophy of the cervix.
Subinvolution.
Pelvic cellulitis.
Chronic metritis.

Epithelioma.
Uterine fungosities.
Uterine displacements.

Symptoms.—If no complicating conditions exist, there may be no symptoms whatever. In other cases, one or more of the following are present:

Pain and tired feeling in back and pelvis, increased on locomotion.
Sterility.
Dyspareunia.
Hemorrhage after coition.
Disordered menstruation.
Neuralgia of the cervix.

To these should be added the symptoms of the various complicating lesions above enumerated.

Physical Signs.—The rent can usually be felt with the finger, but eversion and thickening of the cervical mucous membrane may make this difficult. By the speculum, however—Sims's is preferable—the condition is easily recognized; we see the laceration in the form of a raw-looking patch; with tenacula the lips should be brought together, and thus the position and extent of the rent better determined. The various complicating conditions alter or add to the signs of the laceration.

Differential Diagnosis.—Diagnosis is usually easy; but occasionally the condition may be confounded with granular and cystic degeneration of the cervix, chronic metritis affecting the cervix chiefly, chronic endometritis, and even cancer; careful examination will usually settle all doubt.

Prognosis.—Spontaneous cure, or cure after palliative measures may occasionally but rarely occur; usually, unless operated upon, the condition persists

until menopause, when it is removed or rendered insignificant by the physiological atrophy.

TREATMENT.—May be palliative or curative.

a. Palliative Treatment.—This may be indicated in cases in which complicating cellulitis or other causes render an operation undesirable; it may cause an amelioration of the symptoms, but does not cure.

Among palliative measures may be mentioned: the treatment of the complicating lesions by hot water vaginal injections, the proper treatment of cystic and granular degeneration if these exist, the application of iodine, silver, copper, tannin, and other astringents, the removal of weight from the uterus, etc.

b. Curative Treatment.—This consists in paring the edges of the laceration and uniting them with sutures; the operation is known as trachelorrhaphy, hystero-trachelorrhaphy, or as Emmet's operation.

TRACHELORRHAPHY. *Indications.*—Emmet states, "in a general way, that when reflex symptoms exist, with enlargement of the uterus, after the cellulitis has been fairly removed; and when the woman suffers from neuralgia, or persistent anæmia, an operation is necessary, notwithstanding the parts may have healed completely; and the thorough removal of the cicatricial tissue from the angles is absolutely necessary for success." Most authorities agree that no operation is indicated, if no symptoms exist.

Preliminaries.—Any cellulitis, endometritis, or granular and cystic degeneration of the cervix, should be removed by proper treatment, before the operation is attempted; the vagina should be washed out daily, for some weeks previous, and the woman should be put in the best possible state of health.

Operation.—The woman is anæsthetized, and Sims's

position and speculum used. The margins of the rent are approximated, and the operation thus outlined, they are then pared with the long scissors, care being taken to remove the cicatricial tissue at the angle of the laceration (Dr. Emmet does this with the knife). The margins having been denuded and approximated to see that they fit properly, hemorrhage having ceased, and care having been taken to leave enough mucous membrane to form the cervical canal, the pared edges are now kept together by wire sutures; these are introduced at about one-quarter of an inch from the margin, by short, round needles, threaded with silk, one-third of an inch apart. When the wire sutures are all in place, they are tightened and twisted from above downward, cut off short, and turned down flat upon the cervix, or left hanging out of the vagina and secured by a rubber tube and cotton.

If a bilateral laceration exist, the same proceeding is gone through on the opposite side.

If a multiple or stellate tear is present, it is converted into a bilateral one, by cutting up to the vaginal junction on each side, and then treating this as you would an original bilateral laceration.

When there is great hypertrophy of the cervix, especially of its inner aspect, it is well to cut away sufficient of this excessive tissue to allow the denuded margins to approximate themselves nicely.

After-treatment.—Rest in bed for two weeks; daily vaginal warm water injections; daily rectal enemata if necessary; light and non-stimulating but nutritious diet. The sutures are removed at the end of a week, from above downward, the lower ones being left in several days longer, if union is not strong. A sup-

porting pessary is often desirable for several months after the operation.

If the preparation of the woman for the operation be carried out as described, and the operation done with usual precautions, and the after-treatment properly attended to, ill consequences, such as peritonitis and cellulitis, will very rarely follow.

This operation, which is performed so very frequently in this country, is seldom resorted to in Germany and Austria. During a protracted stay in Europe, not a single example of this operation was seen in the gynecological clinics of Vienna, Berlin, and Munich. [L. S. R.]

CHAPTER VIII.

AFFECTIONS OF THE FALLOPIAN TUBES.

Anatomy—Malformations—Displacements—Tumors—Inflammations—Salpingitis—Tuberculosis—Stricture and occlusion—Patent condition—Dilatation and distention—Hydro- and pyosalpinx—Hæmato-salpinx—Tait's operation for removal of the ovary and Fallopian tubes.

Anatomy of the Fallopian Tubes.

The Fallopian tubes, the excretory ducts of the ovaries, are hollow, trumpet-shaped organs, originating at each superior angle of the uterus, whence they extend outward in an undulatory course for three to four inches, in the middle fold of the broad ligament. They serve to bring the ovum to the uterus, and also to carry spermatozoa.

Parts.—Each tube may be divided into three portions:

1. Interstitial—the portion with capillary diameter, which passes straight through the substance of the uterus.

2. Body—the portion in the broad ligament, which passes downward and backward; diameter larger.

3. Fimbriated extremity or infundibulum—the diameter of which is still larger, about the size of a goosequill; it is thrown into a number of folds, one of which attaches the ovary to the tube, and is known as the tubo-ovarian ligament, or morsus diaboli.

Layers.—Each tube consists of three layers:

1. External—peritoneum.

2. Muscular—consisting of circular fibres internally, and longitudinal fibres externally.

3. Mucous or internal—containing no glands or villi, but thrown into longitudinal folds; it communicates directly with the peritoneum, and is covered by ciliated columnar epithelium, the ciliæ waving toward the uterus.

The blood supply is abundant, and from the same source as that of the uterus.

Affections of the Fallopian Tubes.

The Fallopian tubes are liable to the following morbid conditions:

Malformations.
Displacements.
Tumors.
Inflammations.
Stricture and occlusion.
Patent condition of the tubes.
Dilatation and distention.
    Hydrosalpinx.
    Pyosalpinx.
    Hæmatosalpinx.
Tubal pregnancy.

Malformations of the Fallopian Tubes.

The tube may be *wanting* on one or both sides; or the tubes may be unusually *long*, or one tube may be much longer than the other; there may be *accessory* tubes; they may be *rudimentary;* they may be congenitally *impervious*.

Displacements of the Fallopian Tubes.

The tubes may be displaced from their natural position and their relations to the ovaries by growths from the latter, or within the abdominal cavity.

These displacements are often the result of gonorrhœa, setting up a salpingitis and pelvic peritonitis; this exudation pressing upon the tube, causes displacement.

They may pass into the sac of a femoral or inguinal hernia, usually with the corresponding ovary.

Tumors of the Fallopian Tubes.

The following may occur:

Fibroma.
Lipoma.
Mucous polypus.
Carcinoma.
Cysts.

Inflammation of the Fallopian Tubes.

Synonym.—Salpingitis.

Definition.—An inflammation of the mucous lining of the oviducts.

Occurrence.—Rather frequent after puberty.

Etiology.—Salpingitis may be the result of

Displacements of the Fallopian tubes.
Carcinoma and fibroma of the tubes.
Diseases of the ovaries.
Exanthemata.
Other infectious diseases—cholera and typhoid fever.

When *acute*, it is usually due to *extension* of Gonorrhœal inflammation.

Puerperal endometritis.

Peritonitis.

VARIETIES.—The inflammation may be (1) *acute* or (2) *chronic;* the latter form is by far the more frequent. When the tubes become filled with a serous fluid, the case is known as *hydrosalpinx;* when this fluid is pus, as *pyosalpinx;* when blood, as *hæmatosalpinx.* When tuberculous nodules are found, the inflammation is known as *tubercular salpingitis.*

PATHOLOGY.—*Acute salpingitis* is generally associated with either acute or chronic endometritis; the chronic form is usually associated with pelvic peritonitis and a diseased condition of the ovaries. Salpingitis is often a complication of dermoid, ovarian, and fibroid tumors. The tube when acutely inflamed is enlarged and greatly congested; at first all the tissues are softened. Peritoneal exudation takes place, causing adhesions of the tube to the ovary, or to the uterus. The mucous membrane is swollen and the lumen is either entirely occluded or else filled with a muco-purulent secretion. Salpingitis is usually bilateral; the left tube is usually affected first; it may be unilateral. The acute stage may pass into a subacute one, in which case the swelling diminishes and the adhesions contract, the fimbriated extremity becoming closed and the tube and ovary becoming adherent to the walls of the pelvis, uterus, rectum, or other neighboring parts.

The *chronic variety* causes a gradual thickening of the tube and induration of the mucous membrane; the tube becomes much enlarged and is usually club-shaped. The tube may be constricted in places, or convoluted, one portion being hard and small while another is dilated and excessively thin. As a rule,

cases of chronic salpingitis produce cystic degeneration of the ovary.

Symptoms.—The most important and most frequent symptom is repeated attacks of local peritonitis, or active pelvic congestion. A peculiar burning pain or else a dull aching pain over the tube or ovary or in back is usually present; also dragging pains when the patient is on her feet, similar to those occurring in uterine displacements. Dysmenorrhœa, metrorrhagia, or menorrhagia is often associated. We also have the symptoms due to the accompanying peritonitis. Sterility is the rule; when both tubes are affected it is incurable.

Physical Signs.—When the disease is acute the amount of swelling and tenderness is so great that we can only make out a thickening and fulness of one or both broad ligaments with some fixation of the uterus. After the acute symptoms have subsided we may be able to make out an enlarged tube, which may be somewhat prolapsed and adherent to the broad ligament. When there is a catarrhal inflammation the tubes may not feel distended, but feel like thin bands of adhesions.

Diagnosis.—In the catarrhal form, since there is little if any distention, we cannot diagnosticate it from catarrhal endometritis. In order to make a positive diagnosis we must be able to palpate the enlarged, distended, or greatly thickened tube. If the abdominal walls are lax this may be simple. At times, in order to do so, we may have to give the patient ether. When the uterine end of the tube is patulous, the discharge enters the uterus and passes out through the vagina; and if we are certain that no disease of either vagina or uterus exists, we may assume that the discharge comes from the tube. It is usually gleety in character.

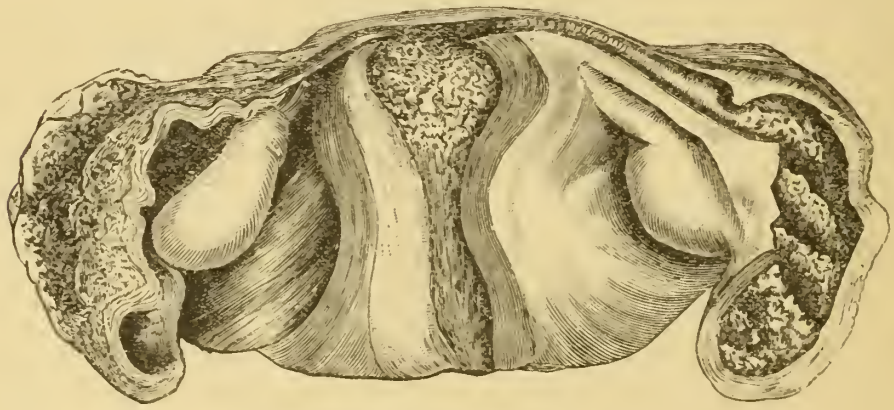
COURSE AND PROGNOSIS.—The recurrent inflammatory attacks may produce stenosis, or occlusion of the tubes, or a perforation into the rectum or abdomen.

Prognosis depends upon whether the affection is a catarrhal or a purulent one. In the latter case it is dangerous, especially when the result of sepsis. Many cases of the catarrhal variety run on for years and cause no marked deterioration in the health of the patient.

TREATMENT.—During the acute stage put patient to bed and keep her quiet. We may use anodynes and counter-irritants. Attend especially to the general health and see that the bowels are opened daily. Pawlick has obtained good results by catheterizing the tubes; but this plan has proven difficult and dangerous in the hands of others.

If a fluctuating tumor can be felt it should be incised and washed out, either through the abdomen, vagina, or rectum. The best method of treating the case is to perform a laparo-salpingotomy or else to remove both ovaries and tubes (Tait's operation, *vide* p. 246).

FIG. 28.



Tubercular salpingitis. (WINCKEL.)

TUBERCULAR SALPINGITIS is not infrequently a primary affection. It may be either acute or chronic (acute

very rare). The tubes are usually drawn down toward the sides of the uterus and held there by a pseudo-membrane. The lumen of the tube is dilated and filled with a cheesy mass. The tubes are always affected in cases of *genital tuberculosis*, and in one-half of the cases of this variety of tuberculosis they are the only organs which are affected (Fig. 28).

Several cases have been diagnosed during life, vaginal examination showing displaced, enlarged, and irregularly shaped tubes. We can only treat the cases symptomatically. Laparotomy is a doubtful procedure.

Stricture and Occlusion of the Fallopian Tubes.

The tube may be thus affected at either end or in the middle of its course. The condition may be congenital or acquired.

The *causes* of the acquired form are:

Salpingitis.
Tumors.
Inspissated mucus.
Pelvic peritonitis.
Senile atrophy.
Calcific deposit.
Torsion.
Pressure from abdominal tumors.

If affecting both sides, sterility is the result. This affection is also of importance from its causing accumulation of fluids; menstrual fluid may be retained, and rupture of the tubes result. Stricture cannot be diagnosticated during life.

Patent Condition of the Fallopian Tubes.

This is of interest in connection with intra-uterine injections, in which the fluid sometimes travels along

a dilated or dilatable tube, and causes shock and peritonitis.

Dilatation and Distention of the Fallopian Tubes.

This condition is the result of stricture of the tube, or of atresia uteri; it is said that the uterine end of the tube may be pervious, and yet distention occur, a certain part of the fluid flowing into the uterus (profluent dropsy of the tube).

The fluid may be serous, mucous, or sero-mucous, when the condition is known as *hydrosalpinx;* it may be purulent—*pyosalpinx;* or it may consist of blood—*hæmatosalpinx.*

Hydrosalpinx and Pyosalpinx.

Definition.—Hydrosalpinx is a tube distended with accumulation of mucous, serous, or sero-mucous fluid; pyosalpinx consists of an accumulation of purulent fluid in a distended tube.

Synonyms.—For *hydrosalpinx:* Hydrops tubæ; tubal dropsy.

Occurrence.—Not frequent.

Etiology.—The filling up of the tube with the watery or purulent fluid which cannot escape may be due to a congenital or acquired atresia at the uterine end of the tube; the fluid contents are the result of an inflammation of the tube.

Pathology.—As a result of the filling-up of the tube a sacculation is produced. The dilatation may reach the size of an apple or even that of a child's head, The tube becomes very thin at certain parts and hypertrophied at others. The mucous coat is perfectly

smooth. The tube is usually adherent to the peritoneum as a result of the circumscribed inflammation.

Physical Signs.—An elongated, tortuous, fluctuating mass, found at one side of the uterus, high up in the pelvis.

Diagnosis.—Difficult. The condition is often confounded with tubal pregnancy. The diagnosis may be made by puncturing the sac with a hypodermic needle, and examining some of the fluid obtained in this manner.

Symptoms.—Sterility is the rule. In many cases there may be no symptoms whatever; in others there are symptoms due to the surrounding peritonitis. If the tube-walls rupture, we will have the symptoms of shock and collapse and, if the patient survive, those of peritonitis are added.

In pyosalpinx there may be the constitutional symptoms due to the existence of retained pus.

Course and Prognosis.—The tumor usually enlarges slowly, it seldom bursts; in some cases atrophy occurs and the contents may become absorbed.

Treatment.—We can either aspirate through the vagina, if we think marked adhesions are present, or remove the tubes and ovaries by abdominal incision, when the dilated tubes are free or but partially adherent; the latter step is known as Tait's operation (*vide* page 246).

Hæmatosalpinx.

Definition.—A Fallopian tube distended with an accumulation of blood.

Occurrence.—Not frequent.

Etiology.—The source of the blood may be the ovary or the uterus, but usually it is the Fallopian

tube itself. Bandl believes it to be the result of the retention of menstrual fluid, due to stenosis or occlusion of the uterine end of the tube.

Pathology.—At first the walls of the tube become hypertrophied, but gradually the portion subject to the greatest pressure becomes thinner and thinner and finally bursts, the contents being discharged into the peritoneal cavity and usually producing death in a short time.

The size, position, and shape of the sac vary. It may become as large as an orange. If it is small it will lie alongside of or behind the uterus; if large it will lie in front of it. Its shape is the same as that of hydrosalpinx.

Physical Signs.—An irregular, not nodulated mass lying to one side of, behind, or in front of the uterus.

Diagnosis.—The diagnosis can only be made with certainty in cases in which there is coexisting hæmatokolpos and hæmatometra.

Symptoms.—Similar to those of hydrosalpinx, except that they are increased during the menstrual periods.

Course and Prognosis.—It is believed by some that, very rarely, the fluid works its way through the stenosed portion of the tube and thus gets into the uterus. As a rule, however, the walls diminish in thickness until rupture finally ensues; consequently the prognosis is dubious.

Treatment.—The tumor should not be aspirated. Laparotomy gives the only chance of relief.

Tait's Operation—Removal of the Ovary and Fallopian Tube.—A small median incision is made into the abdominal cavity, about half-way between umbilicus and pubes, care being taken in cutting through the peritoneum not to wound the intestines.

The index and middle fingers are now passed down to the fundus uteri, and along this to the ovary, and a moderate amount of traction made, so as to bring this organ into the abdominal wound; should the tube or ovary be distended, the contained fluid is first let out by the aspirator. A loop forming a double ligature is now passed through the broad ligament, and, being cut, two ligatures result; these are tied, one being passed across the other, so as to prevent the tissues from splitting. The Fallopian tube and vessels beneath are now included in a ligature near the horn of the uterus; another is passed around the ovary and tied below. The ovary and tube are then cut off as close as possible, but enough tissue is left to hold the ligature. The process is repeated on the other side. The stump is allowed to remain in the peritoneal cavity. All hemorrhage is checked by ligature or pressure, the peritoneal cavity thoroughly washed out and carefully dried out with sponges, and the abdominal wound then carefully sewed up.

Mr. Lawson Tait does not use Listerism; he gets just as good results without it and says he avoids the risk of carbolic acid poisoning. In "A Series of One Thousand Cases of Abdominal Section," published in the *Medical Record*, January 3, 1885, Mr. Lawson Tait reports "Removal of appendages for inflammatory disease, 201 cases; deaths, 10; mortality, 5 per cent." Since then he is said to have had even a smaller percentage of deaths from the operation.

Tubal Pregnancy

Will be treated of under "Extrauterine Pregnancy" (Chapter XIV.).

CHAPTER IX.

AFFECTIONS OF THE OVARIES.

Anatomy of the ovary—Physical examination—Malformations—Displacements—Prolapse—Hernia of ovary—Tumors of the ovary—Solid tumors of the ovary—Fibroma—Carcinoma—Sarcoma—Cystic tumors of the ovary—Cysto-fibroma—Cysto-sarcoma—Cysto carcinoma—Hydrops folliculorum—Dermoid cysts.

ANATOMY OF THE OVARY.—The ovary is a small, almond-shaped body, weighing between one and two drachms, lying one and a half inches from the uterus, in the posterior fold of the broad ligament, its position varying considerably. Its function is the periodical ripening and discharge of ovules.

It is one and a half to two inches in length, three-quarters of an inch in breadth, and one-quarter to one-half of an inch in thickness; it presents two extremities—an outer, bulbous; an inner, attenuated; and is attached to the uterus by a fibrous cord, the utero-ovarian ligament; it has two borders—a superior, straight and presenting the hilum, and an inferior, rounded. At puberty it is smooth; but after awhile it becomes wrinkled and scarred; after menopause it atrophies and again becomes smooth.

In structure it is glandular, and consists of a connective-tissue stroma, between which are follicles, bloodvessels, nerves and lymphatics. It presents the following *layers:*

1. External—consisting of columnar epithelium directly continuous with and taking the place of the peritoneum.

2. Cortical—composed of connective tissue and muscular fibres, containing the small Graafian follicles; most externally, this layer is somewhat condensed and called the tunica albuginea.

3. Medullary—containing connective tissue, larger Graafian follicles, and muscular fibres accompanying and surrounding the bloodvessels.

Arterial Supply.—The ovarian artery sends ten to twenty branches into the ovary at its hilum; these ramify in the medullary layer, some passing out into the cortex to supply the Graafian follicles.

The Parovarium or Organ of Rosenmüller.—This is a pyramidal body, the base turned toward the Fallopian tube, the apex being lost on the surface of the ovary, composed of from ten to twenty white tortuous tubes with blind extremities; it is placed in the posterior fold of the broad ligament. It is the remains of the Wolffian body of fœtal life and corresponds to the epididymis of the male; it has no excretory duct, and its function is unknown.

Physical Examination of Normal Ovaries.—The normal ovaries can only be mapped out in certain favorable cases, such as in women with very thin and lax abdominal walls; of 1600 unselected cases, Mundé found one or both ovaries palpable in 145 cases, of which 68 were in normal position and 53 of normal size.

The woman should be placed upon the back, with thighs and legs flexed and abducted; with one finger of one hand in the vagina and the other hand upon the abdomen, the organ may be felt on a level with the brim of the pelvis, a short distance external from the upper angle of the uterus, and about midway between

this point and the inner margin of the psoas muscle or the pelvic brim.

Sometimes we can feel the organ by the rectum, the uterus having been drawn down to facilitate palpation. Usually the left ovary is more easily palpated than the right.

Affections of the Ovaries

Include:

- Malformations—
  - Absence.
  - Imperfect development.
  - Premature atrophy.
  - Additional ovary.
- Displacements—
  - Prolapse.
  - Hernia.
- Tumors.
- Inflammations—
  - Acute ovaritis.
  - Chronic ovaritis.
- Disturbances of circulation—
  - Hæmatocele or apoplexy.

Abnormalities in Development of the Ovaries.

These include:

- Absence.
- Imperfect development.
- Premature atrophy.
- Additional ovary.

Absence or a *rudimentary condition* of one or both ovaries may exist; such a condition usually accompanies a similar one in the uterus and other generative

organs. The ovaries may never become changed from their condition in infancy or girlhood, and the woman then usually retains the qualities of a girl, and physiologically never reaches womanhood.

In some cases, the usual post-menopause *atrophy* sets in at a much earlier period; this is generally the result of a pelvic or ovarian inflammation.

The most marked symptom of these abnormalities is *amenorrhœa*, and under this head will be considered the proper treatment of these cases.

In rare cases, a *third ovary* has been found; this may explain the fact that, after certain cases of removal of the ovaries, menstruation has continued.

Displacements of the Ovary.

The ovary can be displaced in any direction. With rare exceptions, however, the following are the only forms which occur:

1. Prolapse of ovary.
2. Hernia of ovary.

Prolapse of the Ovary.

Definition.—A dislocation of one or both ovaries downward, and usually also posteriorly.

Occurrence.—The ovary is very movable, and even when normal, changes its position very often; hence prolapse is easily produced by the various exciting causes. This predisposition is increased by the increase in length of the ovarian ligaments after repeated pregnancies; therefore it is much more common in multiparæ than in nulliparæ: 77 out of 145 palpable cases reported by Mundé in 1600 unselected cases,

were affected with prolapse. The left is prolapsed much more frequently than the right.

Etiology.—Anything which increases their weight, causes traction from below or pressure from above, or causes feebleness or lengthening of their supports. As predisposing and exciting causes may be mentioned:

Repeated parturition.

Enlargement of the ovary from congestion, inflammation, or tumors.

Inflammatory adhesions due to peritonitis and cellulitis.

Displacements of the uterus, especially the posterior ones and prolapse.

Tumors, ascites, feces, etc., pressing from above.

Feebleness and lengthening of supports,

by subinvolution.

by frequent parturition.

by general debility, etc.

Sudden jars to the body—probably rare.

Varieties.—Mundé classifies them as follows:

1. Recto-lateral; into the lateral pouch of Douglas.

2. Recto-uterine; into Douglas's pouch.

3. Ante-uterine; into the vesico-uterine or paravesical pouch; very rare.

4. Into the infundibulum of an inverted uterus; extremely rare.

Pathology.—Besides occupying an abnormal position, the ovary is usually enlarged, often very sensitive to touch, and sometimes fixed by peritonitic adhesions. The condition is often accompanied by displacements of the uterus.

Symptoms.—These vary in degree, chiefly depending

upon the condition of the prolapsed ovaries; there may be no symptoms or inconvenience whatever.

The symptoms may be both local and general, and any or all of the following may be present:

Radiating neuralgic pains in pelvis and surrounding parts.

Pain on coition and defecation.

Dragging sensations in groins and down thighs.

Nervous irritability.

Reflex nervous symptoms, melancholia, etc.

Physical Signs.—In examining bimanually in the method already given, the prolapsed organ is usually felt in Douglas's pouch or to one side of it; if the ovary be enlarged, its detection is rendered still easier. Rectal examination may also be resorted to, to clear up any doubt.

By pressure we cause a sickening pain, which, when the organ is inflamed, is sometimes very severe.

The condition must not be confounded with fecal masses.

Prognosis.—Though not directly involving the life of the patient, still, after a time, the ovary is liable to become congested and sensitive, and this ultimately results in inflammation and changes in the organ. Hence it is well to replace the organ, even if no decided symptoms attend the prolapse; especially is this desirable in married women, and in these the great majority of cases occur.

Treatment consists in replacing the organ and keeping it in its proper position by means of a pessary.

Should the organ be very sensitive and irritable, we should first endeavor to remove this condition by the use of glycerin-saturated cotton tampons, astringent

injections, or by suppositories of iodoform, belladonna, tannin, or iodide of lead, applied directly to the sensitive spot, and held there by tampons.

After this the organ is replaced, with the woman in the knee-chest position, any malposition of the uterus being corrected at the same time; a pessary is then applied.

In the selection of a proper pessary, we aim at accomplishing one of two things: Either one which will fill out the space between the cervix and the rectum, or one which will put this part upon the stretch, and in this way prevent prolapse of the ovary. Thomas's bulb pessary, Smith's, Noeggerath's, Emmet's malleable, or Mundé's special pessaries may be used in different cases.

Should it be impossible to retain the organ in its proper place by any of these means, Battey's operation might be justifiable if the condition caused much suffering.

If the ovary is fixed in its prolapsed position, it cannot, of course, be replaced; then we must be content with local treatment calculated to relieve its hyperæsthesia and congestion; in these cases Battey's operation would be difficult and risky.

Hernia of the Ovary.

The ovary occasionally forms one of the contents of a hernial sac; it may be the only organ, but usually it accompanies the protrusion of other organs, such as the tubes, intestines, etc.

The *causes* are partly those of prolapse of the ovary, partly those of hernia in general; most cases are congenital.

The most frequent *site* is the inguinal canal (canal of Nuck); rare cases of femoral, umbilical, ventral, ischiadic, and obturator hernia of the ovary have been reported.

There may be no *symptoms* at all, or a train of results resembling that of prolapse may present itself.

Treatment consists in replacement by taxis and retention in position by proper bandages, pessaries, and trusses. Should the ovary be irreducible, and give rise to considerable discomfort, removal might be advisable; this has been done successfully on several occasions.

Tumors of the Ovary.

These may be classified as follows:

Solid:

- Fibroma.
- Sarcoma.
- Carcinoma.
- Papilloma.

Cystic:

- Cysto-fibroma.
- Cysto-sarcoma.
- Cysto-carcinoma.
- Simple follicular cysts, or hydrops folliculorum.
- Dermoid cysts.
- Adenoid cysts—ordinary ovarian cysts and cystomata, and the ones we usually refer to when we speak of "ovarian cysts, or cystomata."

The pathology of ovarian tumors being very much in the dark, an unobjectionable classification is impossible.

We will now briefly consider the various tumors just

enumerated, and, lastly, take up more extensively the most common—the adenoid cysts.

Solid Tumors of the Ovary.

Fibroma of the Ovary.

Definition.—A solid, dense tumor of one or both ovaries, composed of fibrous tissue.

Occurrence and Etiology.—Occurrence uncommon; etiology unknown.

Pathology.—It rarely attains a considerable size; exceptionally it grows so as to be as large as an adult's head. The growth is usually diffuse, and is usually confined to the ovary of one side. It may undergo cystic degeneration, and then form a cysto-fibroma; rarely they suppurate or undergo calcific degeneration.

Symptoms.—Those which occur with pelvic tumors in general. They vary with the size of the tumor; very often they are insignificant.

Physical Signs and Differentiation.—Palpation of the ovary would reveal the growth, but it would be difficult to distinguish it from a pedunculated, subperitoneal uterine fibroid. From an ovarian cyst, its hardness and gradual growth would distinguish it. These signs and its regular outline, its isolation, and the absence of cachexia, would prevent its being confounded with carcinoma.

Course and Prognosis.—The course is slow and the prognosis favorable, since they rarely reach an inconvenient size.

Treatment.—Is usually limited to the removal of any symptoms due to the mechanical effects of the tumor. Occasionally its size and inconvenience become so

great that ovariotomy is justifiable; this operation is more difficult and dangerous in these cases than in ovarian cysts.

Carcinoma of the Ovary.

Definition.—A malignant tumor of the ovary having the characteristics of cancer elsewhere.

Occurrence.—As a primary condition it is rare, and then usually bilateral; secondary cancer by metastasis or extension is not infrequent. It occurs at an earlier period of life than does cancer elsewhere (under thirty). The cause of this is said to be the fact, that at this time there is the period of greatest sexual activity.

Pathology.—There are two forms—medullary and scirrhus; the medullary is the more common. The infiltration may be diffuse or nodular, and the resulting mass small or as large as an adult skull.

Carcinoma may undergo cystic degeneration and form cysto-carcinoma; or the wall of an ovarian cystoma may become infiltrated with cancerous material, either in the form of nodules, diffusely, or as villous projections, internally or externally; these villous masses may be so abundant as to fill the cyst and cause its rupture.

With carcinoma we usually have chronic peritonitis, local or general, and abundant ascites.

Symptoms.—These vary greatly, but are usually marked. They are due to the mechanical effects of the tumor, to the constitutional effects of cancer, to the accompanying chronic peritonitis, and to the extension of the growth to neighboring parts (producing stricture of the intestines, etc.).

Pain, which is usually a prominent symptom in car-

cinoma elsewhere, is not marked as a rule; when it does occur, it comes on gradually, beginning in the groin and running down the thighs. Menstruation is apt to be disturbed; first there is menorrhœa, then great irregularity, and, finally, amenorrhœa. There is vesical irritation and painful and difficult defecation. There may also be colicky pains due to pressure on the small intestines. The ascites, which is almost always present, develops early and rapidly; if removed by tapping, it returns quickly. The cancerous cachexia is very marked, and occurring in a woman under thirty, is said to be almost pathognomonic of carcinoma of the ovary.

Physical Signs.—We find a hard tumor of variable size and irregular outline; usually on both sides. This tumor is tender upon pressure, and is often bound down by adhesions. Cancer is often present in other parts of the body. Marked ascites is usually present.

Differential Diagnosis.—It should be diagnosticated from ovarian cystoma and uterine fibroids, with ascites.

The signs just enumerated, together with the cachexia, constitutional enfeeblement, general dropsy, local lancinating pain, and the rapid growth of the tumor will usually serve to differentiate.

It may be necessary to puncture, or even justifiable to make an exploratory abdominal incision for the purpose of diagnosis.

Examination of the ascitic fluid, in cases of malignant ovarian disease shows, as pointed out by Foulis and Thornton, the existence of groups of round and ovoid cells, similar to those composing the tumor: hence such examination is of great diagnostic value.

Course and Prognosis.—Course is rapid, and prognosis bad. Even though we resort to ovariotomy, the usual result is death from the operation and in the proportionately few cases which recover there is only a short prolongation of life.

Treatment.—Treat the symptoms as well as possible, and try to make the patient as comfortable as the condition will permit, by the use of opium, etc.

In cases in which there are no adhesions, laparotomy can be performed and the tumor removed; but when numerous adhesions exist, the patient usually dies of shock if the operation is undertaken. The disease usually returns after removal and in this respect differs from spindle-celled sarcoma of the ovary, which seldom returns after removal. Temporary relief can also be obtained by drawing off the ascitic fluid: this, however, quickly reaccumulates.

Sarcoma of the Ovary.

This growth is of infrequent occurrence, usually affects both sides, and is of the spindle-shaped variety largely supplied with bloodvessels; it is often mixed with fibrous tissue; it may undergo cystic degeneration (cysto-sarcoma).

In size and physical signs it resembles ovarian carcinoma; but metastases and adhesions to neighboring parts are less common.

The symptoms, prognosis, and treatment are similar to those of carcinoma of the ovary; prognosis is somewhat more favorable.

Papilloma of the Ovary is also described, but is exceedingly rare.

Cystic Tumors of the Ovary.

Cysto-fibroma. Cysto-sarcoma. Cysto-carcinoma.

These are cystic tumors with varying proportions of fluid and solid constituents, due to cystic degeneration of preëxisting solid tumors; this process takes place either through the formation of cysts in the interior, or, in the case of sarcoma and carcinoma, also by liquefaction of the central part of the mass.

The walls of ordinary cystomata may become infiltrated with carcinomatous or sarcomatous material, and then these could not be differentiated from the preceding.

What has been said of solid fibroma, sarcoma, and carcinoma of the ovary, applies equally to these cystic forms; the only difference is the tendency to increased rapidity of growth and immense size, as compared with the solid forms.

Hydrops Folliculorum.

Dropsy of the Graafian follicles or simple follicular cyst of the ovary consists of a dilatation of one or more of the Graafian follicles, so as to form retention cysts; this may also occur after rupture of the follicle, or even into the corpus luteum.

One or both ovaries may become affected; it may occur at any period of life. They occur quite commonly, but are usually few in number and small in size. Occasionally they grow to considerable size, and many of them may coalesce.

Their contents are usually serous and colorless; rarely viscid, colored, turbid, or purulent.

Since they usually exist without giving rise to symptoms, they are chiefly of interest pathologically, and require no further consideration.

Dermoid Cysts of the Ovary.

Definition.—These are cysts of an embryonal origin, formed by an inclusion of the epiblast, lined by the integument and its appendages, and containing epithelium, hair, bone, cartilage, teeth, striated muscles, nerve cells and fibres, fat and cholesterine; the contents are of a thick greasy consistence.

Etiology and Occurrence.—They are congenital, but may remain undeveloped for many years. Elsner's theory, which is the one most frequently accepted, is that they occur, externally and internally, in places where the epiblast dips down to meet the hypoblast, and where by processes of grooved involution new bodies are formed; therefore they are embryonal in structure.

They are usually single, affect one ovary only, and are of small size, but exceptionally they may become as large as an adult skull.

Symptoms.—The presence of these tumors retards the advent of puberty. They are lodged in Douglas's pouch. They are innocent tumors, sometimes giving rise to symptoms on account of their mechanical effects only; but occasionally the wall undergoes calcific or carcinomatous degeneration, or the contents liquefy, suppurate, or discharge into the peritoneal cavity, and then they give rise to more formidable symptoms.

They may give rise to no symptoms, but owing to their tendency to become inflamed and to suppurate, they may cause dangerous symptoms. By becoming

adherent to neighboring organs they cause displacements and symptoms which are the result of these and of pressure upon these organs. When they rupture, the contents are discharged either through the vagina, rectum, or rarely through the bladder, or into the peritoneum. When into the last, they cause a rapid and fatal peritonitis.

Fig. 29.

Dermoid cyst of the ovary.

Diagnosis.—A small, thick-walled tumor in the cul-de-sac of Douglas, which is adherent, occurring in a young woman and growing slowly, is likely to be a

dermoid cyst; but we cannot be certain unless some of the contents escape, or we make an exploratory incision. In rare cases, bones or teeth may be felt by vaginal examination.

Prognosis.—Depends upon whether or not the cyst suppurates and bursts. If it does not burst, it may not interfere materially with the general health; whereas, if it bursts, the dangers of peritonitis, septicæmia, etc., will ensue.

Treatment.—The cyst should either be removed, or incised freely and drained, or else left alone. Aspiration is contra-indicated. Total extirpation is the best plan of treatment. It should be shelled out from the surrounding adhesions entire, without puncture. The complications also require special care and management.

CHAPTER X.

AFFECTIONS OF THE OVARIES (*continued*).

Adenoid cysts ("ovarian cystomata")—Parovarian cysts.

Adenoid Cysts of the Ovary.

HAVING dismissed the less frequent forms of ovarian tumors, we now take up the discussion of the common variety—the one which we refer to when we speak of "ovarian cyst or cystoma" without adding any distinctive qualifying adjective.

SYNONYMS.—Ovarian cysts. Ovarian cystomata. Cystoma ovarii. Adenoma of the ovary. Cystic adenomata of the ovary. Compound ovarian cysts.

OCCURRENCE AND ETIOLOGY.—Very little or nothing is known of the etiology. The predisposing causes usually given are:

Age.
Repeated parturition.
Disorders of menstruation.
General depreciation of health.
Anæmia.
Chlorosis.
Scrofulous diathesis.
Chronic ovaritis (?).

It occurs most frequently between the ages of twenty and forty, is rare before twenty or after fifty, but cases have been observed in infancy and in extreme old age.

It occurs more frequently in multiparæ and in married women, than in others.

It occurs much more frequently among the poor than among those better situated.

Pathology.—Under this head we discuss (1) mode of origin, (2) gross anatomy, (3) minute anatomy, (4) contents, (5) secondary changes and degenerations.

(1) *Mode of Origin.*—Cystomata are probably glandular formations which have undergone cystic degeneration. Many theories have been put forward to explain their origin; two of these meet with most credence, and will be explained.

(*a*) According to Waldeyer, they are formed by distention of the tubules of Pflüger; these are tubular follicles which originally dip down into the ovarian stroma from the epithelial layer covering the organ, which have not become developed into Graafian follicles. Although the formation of cystomata does not usually take place until adult life, yet these tubules exist at birth and may even be slightly cystic at this period. The tubules are lined by epithelium, and this is spread out and forms the inner wall of the cystoma, some of them breaking down and forming part of the contents, while the external wall is the ovarian stroma. The distention is caused partly by the breaking down and liquefaction of some of the cells of Pflüger's ducts, and partly by exudation from the bloodvessels.

Having been formed in this way, their growth may be modified in two different methods: First, in the form which Waldeyer calls glandular (cystoma ovarii proliferum glandulare), the epithelium proliferating, grows outward, and these external protrusions form new glandular follicles, the openings of which soon become occluded; from these other follicles may sprout, and these again become cystic, and thus increase in size.

Secondly, in the papillary form (cystoma ovarii proliferum papillare), the connective-tissue growth of the cyst-wall predominates and sprouts into the cavity of the cyst, pushing the epithelium before it; in this way vascular papillæ are formed, which may line the inner surface or fill the entire cavity of the cyst-wall and even rupture it; these papillæ may join and form smaller cysts.

In both these forms there is at first a large number of cysts, and the walls separating them may gradually break down, and thus the number of separate compartments becomes smaller as their size increases. The two forms may exist in combination.

(*b*) Another mode of formation of these tumors was advanced by Noeggerath, who pointed out that diseased bloodvessels might be the source of the cystomata. He believes that the so-called Pflüger's ducts are diseased vessels; that the intima of these becomes diseased and loses its endothelium, and that then the contents of the vessel pass into the interstices of the intima, and in this way cystomata are formed—the large granular cells found being altered white blood-cells.

At present we cannot be certain of the exact method of formation.

(2) *Gross Anatomy.*—Ovarian cystomata may occur in one or both ovaries. Usually only one is affected, though the other ovary is often diseased, and may contain small cysts. The right ovary is more frequently affected than the left. Their size varies greatly; they may be very small or may fill up the entire abdomen.

They are connected with the uterus by a pedicle, which varies in length and thickness, and which usually consists of the ovarian ligament, Fallopian tube,

and broad ligament. Variations in the length and thickness of the pedicle depend upon the changes in the thickness of the tube and the broad ligament. Some cysts are, however, sessile or non-pedunculated, these being often intra-ligamentous and firmly adherent.

It is usually easy to distinguish three distinct layers, though one or more may be wanting: First, an external or serous layer; second, a middle or fibrous layer; third, an internal or cellular layer.

The outline of the growth is rounded, and often smaller projecting cysts are seen upon the main one. The ovary being covered externally by columnar epithelium, and, hence, resembling a mucous membrane, adhesions to the abdominal parietes and neighboring organs do not take place until after the tumor becomes very large, its wall excessively stretched, and the epithelium flattened and altered; then adhesions form very readily, and may be quite extensive; the small cystomata, therefore, are usually free, whilst the larger ones are often extensively adherent.

On section, we find a variable number of cysts differing in size. The proportion between solid and fluid constituents varies; since they are originally purely glandular, there may be no marked cystic formation at all. At first these tumors are multilocular, and when they become unilocular, or the cysts diminish in number, it is by coalescence, and by disappearance of the dividing wall.

The facts just stated have given rise to the division into:

a. Unilocular, oligocystic, paucilocular, or monocystic; when only one or very few large spaces are present.

b. Multilocular or polycystic; when there are many small spaces separated by walls of variable thickness.

c. "Compound ovarian tumor;" in which the proportion of solid to fluid constituents is considerable.

(3) *Minute Anatomy.*—Much of the appearance presented under the microscope can be inferred from what has been said in the paragraph on the mode of origin. The wall of the cyst is composed of an external envelope of modified peritoneum, often very thick; beneath this is the connective tissue of the ovarian stroma, and this is lined by columnar epithelium; it presents partition walls, or vascular villous processes, projecting inward.

(4) *Contents.*—These differ very much in different examples, and even in the different cysts of the same case.

a. Physical Characters.—It varies from a thin serous fluid to a thick gelatinous mass; it is usually viscid. In color it may be almost colorless, but more frequently it varies from yellow or green to red or chocolate. It may be transparent or turbid. The specific gravity usually varies from 1010 to 1020, and is generally higher in multilocular than in unilocular, and in recent than in old cases.

b. Chemical Properties.—Eischwald's results, though twenty years old, are those usually given.

According to this investigator, the fluid contents of the cyst may be divided into two classes: mucous and albuminous; the two are usually mixed, but one or the other predominates—the mucous in younger, the albuminous in older, cysts.

The *mucous* group consists of:

1. Substance of colloid corpuscles (the result of colloid degeneration) or mucous corpuscles.
2. Mucin, formed from the preceding.
3. Colloid substance, a further product.

4. Muco-peptone, the final result, which is soluble in water, and, hence, renders the contents more fluid.

The *albuminous* group consists of:

1. Albumen (and fibrin), free, coagulable by boiling.

2. Albuminate of soda, coagulable by boiling, after addition of an acid.

3. Paralbumen, derived from albumen, precipitated by passing a stream of carbon dioxide through the fluid.

4. Metalbumen, a further product of albumen, and distinguished by being precipitated by magnesium sulphate.

5. Albumino-peptone (and fibro-peptone), a final product of metamorphosis from albumen (and fibrin), like that occurring in the stomach.

Besides these organic ingredients, there are suspended insoluble elements, and salts of potassium, sodium, calcium, and magnesium, in small quantity in solution in the watery base.

The mucous class is distinguished from the albuminous by containing sulphur, and by not being precipitated by tannic acid and the neutral metallic salts.

Ovarian cystomata always contain albumen, and, hence, this will be coagulated upon boiling; the quantity, however, varies, and it may be present in the form of albuminate of sodium, and, hence, require the addition of an acid previous to ebullition, to cause turbidity.

c. Microscopic Examination.—We may find few or no structural elements, or any or all of the following may be present, in smaller or larger amount (Delafield and Prudden):

Red blood-globules.

Pus cells.

Pus cells in fatty or granular degeneration.
Fragments of degenerated pus cells.
Cylindrical, flattened, or polyhedral cells.
The same, swollen, or the seat of granular and fatty degeneration.
Fragments of the latter.
Free fat globules.
Cholesterin crystals.
Pigment granules.
Granular detritus.

The so-called Drysdale's corpuscles, or ovarian granular cells, are simply fragments of, or entire, pus or other cells, swollen, or the seat of granular and fatty degeneration. They have been considered characteristic of ovarian cystoma; but though frequently present, they are not pathognomonic, since they are also found in the contents of various other cysts and cavities.

(5) *Secondary Changes and Degenerations.*—The following may occur :

a. Adhesions to surrounding parts (see gross anatomy).

b. Twisting of the pedicle; and, as a result of this, obliteration of the cyst and atrophy, or venous congestion and hemorrhage into the cyst (this may be fatal), or suppuration and gangrene of the cyst wall, inducing peritonitis, septicæmia, and, usually, death.

c. Atrophy of cyst wall and spontaneous rupture.

d. Fatty degeneration of the cyst wall, circumscribed or diffuse.

e. Calcareous degeneration of the cyst wall, checking growth.

f. Suppuration of the cyst wall as a result of blows,

tapping or twisting of the pedicle; this causes septicæmia, peritonitis, and rupture of the sac.

g. Gangrene of the cyst wall; causes and results same as those of suppuration.

h. Hemorrhage into the tumor, especially in the papillary form, or from traumatism, or through twisting of the pedicle; it may result fatally.

i. Rupture of the sac into the peritoneal cavity, and absorption of contents and spontaneous cure has resulted; or by means of adhesions, spontaneous evacuation through rectum, bladder, vagina, uterus, or abdominal walls, may occur; but, usually rupture is followed by peritonitis, septicæmia, and death. Such a rupture may or may not be preceded by suppuration or gangrene of the cyst wall, or be caused by internal hemorrhage, by extraordinary growth of the papillary projections internally, traumatism, or unknown factors.

j. Malignant degeneration of the cyst wall may occur; sarcomatous or carcinomatous.

Symptoms.—At first, whilst the tumor is still small, no symptoms may be noticed; when it becomes large enough to fill the cavity of the true pelvis, pressure symptoms are produced; finally, when it becomes still larger, so as to leave the pelvic cavity, there may be a temporary amelioration of symptoms; but as it increases and fills the abdominal cavity, symptoms are complained of—due to pressure, and to the effects upon the constitution from inconvenience and drain upon the system.

The following symptoms may be mentioned; the first few occur early, all of them late in the disease; still, only a few symptoms may be present in any one

case, and even in a well-marked example many of the following may be absent:

Neuralgic pains in pelvis.

Feeling of weight and distention in pelvis.

Irritability of the bladder, from pressure.

Retention of urine, from pressure.

Constipation (from pressure) alternating with diarrhœa.

Difficulty in defecation, from pressure.

Disorders of menstruation; dysmenorrhœa or amenorrhœa.

Distention of superficial veins of abdomen and lower extremities, from pressure.

Hemorrhoids, from pressure.

Diminution in urine; from congestion of kidney, due to pressure.

Due to interference with the general health:

Nausea.

Vomiting.

Diarrhœa.

Anæmia.

Emaciation.

Peculiar anxious ovarian expression of face.

Œdema of lower extremities and vulva; due to anæmia and to venous congestion.

Ascites; due to local or general chronic peritonitis.

Palpitation of the heart; from displacement upward of diaphragm.

Dyspnœa; from displacement upward of diaphragm.

Occasionally there are mammary changes similar to those of pregnancy.

Symptoms due to Changes in the Cyst—(Hemorrhage into cyst, suppuration of contents, twisting of pedicle or rupture):

Hemorrhage into the cyst and *suppuration* of the contents are due to *torsion* of the pedicle. As a rule, strangulation follows. There will then be a sudden occurrence of severe abdominal pain and tenderness, followed immediately by vomiting of material which soon becomes green. A rapid, feeble pulse and evidences of internal hemorrhage quickly present themselves. The sac rapidly increases in size and is extremely sensitive on palpation. The patient dies either from shock and loss of blood or from peritonitis.

The cysts may *rupture* spontaneously, but the rupture is usually due to violence. If the fluid is unirritating, no serious symptoms may be produced. Par-ovarian cysts have apparently been radically cured in this manner.

The symptoms of *rupture* are sudden, acute pain, collapse, change in form of tumor. If shock does not kill, then patients usually succumb to the general peritonitis.

Complications.—The most frequent are:

Pregnancy.
Ascites.
Bright's disease.
Pleurisy.
Pericarditis.
Peritonitis.
Chronic gastritis.
Fecal impaction.
Septicæmia.
Hernia.
Bedsores.

Physical Signs and Differential Diagnosis.—In many cases the diagnosis is straightforward and easy; in others, however, it may be difficult; hence, in ar-

riving at a diagnosis, we should consider the physical signs fully and systematically, and should then strengthen our diagnosis by the exclusion of all other conditions with which ovarian cystoma may be confounded.

Besides making the usual physical examination of the patient, we may examine the fluid contents of the tumor by withdrawing some with a hypodermic needle. The fluid should be examined both microscopically and chemically. It is sometimes justifiable to make an exploratory incision into the abdomen.

The bladder and rectum having been emptied, and pressure from above and around the waist removed, the woman should be placed on her back upon a hard, flat surface, knees drawn up and abdomen uncovered. It is essential that the abdominal walls be relaxed; should nervousness or abdominal tenderness render this impossible, ether must be employed.

Considerable difference will of course exist in the physical signs, according to the size of the tumor. Usually we are not called upon to make a diagnosis before the tumor has become of such a size as to occupy more or less of the abdominal cavity; nevertheless, the signs in the two degrees of development of the tumor are so different that it is convenient to consider them under two heads: (*a*) When small and pelvic in position; (*b*) When large and chiefly abdominal in position.

a. When Small and Pelvic in Position.—Abdominal inspection, manipulation, palpation, mensuration, and percussion do not usually reveal anything except an abnormal fulness in the pelvis; auscultation is negative.

By vaginal, rectal, and bimanual examination, we find a tumor on one or the other side or in front of or behind the uterus; the tumor is rounded, well defined, distinct from the uterus, but joined to it by a pedicle of varying length. It feels tense, elastic, and fluctuating, and on aspirating or tapping we get ovarian fluid. The cervix and body of the uterus are found displaced to one or the other side or forward or backward, and are not elongated. Owing to the pelvic cavity being filled by the mass, the tumor and the uterus are usually not very movable.

Differentiation.—The conditions with which these small intrapelvic cystomata may be confounded are:

Solid tumors of the ovary.
Cysts of the broad ligament.
Tumors of the Fallopian tubes.
Pregnancy.
Retroverted gravid uterus.
Tubal and interstitial pregnancy.
Fibroid and fibro-cystic tumors of the uterus.
Uterine moles.
Pelvic cellulitis.
Pelvic peritonitis.
Pelvic abscess.
Pelvic hæmatocele.
Encysted intra-peritoneal effusion into Douglas's pouch.
Cysts connected with the spinal cord.
Fecal accumulations.
Perityphlitis.
Enchondroma and carcinoma of pelvic walls.

Solid Tumors of the Ovary.—These are uncommon. They feel hard and do not fluctuate. On puncturing, no fluid is obtained. If they be malignant, we will

find ascites, and in this fluid discover the peculiar cells already described.

Cysts of the Broad Ligament.—These parovarian cysts are supposed to be formed by distention of one of the tubes forming the organ of Rosenmüller. They rarely attain any considerable size. They are always uniocular and contain muscle cells in their wall. Fluctuation is obtained very distinctly and superficially. Tapping causes disappearance of the tumor and often effects a cure; the contained fluid is clear, thin, containing a large amount of sodic chloride, and a trace of albumen.

Tumors of the Fallopian Tube.—Solid tumors are readily differentiated. Hydrosalpinx and pyosalpinx are more difficult to diagnosticate. When of moderate size, they are more movable, and tortuous and elongated, or beaded from side to side, and become narrow toward the uterus. When this condition attains a large size, it becomes more rounded, and closely resembles an ovarian cyst. Tapping and examination of the fluid will aid in the diagnosis; in hydrosalpinx, the fluid is serous and straw-colored; in pyosalpinx, purulent.

Normal Pregnancy.—A pregnant uterus has several times been mistaken for an ovarian cyst. The rational symptoms of the two may have slight similarity, hence considerable reliance must be placed upon a thorough application of the physical signs; in cases of doubt, it is justifiable to dilate the cervix and explore the uterine cavity, even at the risk of abortion. Should auscultation reveal the fœtal heart-beats, this would be diagnostic; but even when the fœtus is dead, the diagnosis is still not usually difficult. After an ovarian

tumor is recognized, the existence of coincident pregnancy must be eliminated.

Retroverted gravid uterus is similarly differentiated.

Tubal and Interstitial Pregnancy.—This will be more difficult to differentiate; but the enlargement of the uterus, history of the case, marked mammary and other evidences of impregnation, together with the existence of an elongated tumor in either groin, of short duration and rapid growth, will decide.

Fibroid and Fibro-cystic Tumors of the Uterus.—The only variety of fibroma of the uterus liable to be confounded is the pedunculated subserous form. Here the hardness, close connection with the uterus, possible existence of other fibroids, and negative results of tapping would settle any doubt. The uterine fibro-cysts are more easily confounded; the most reliable differential points are: Slower growth, less rapid implication of the general health, enlarged uterine cavity, closer connection with the uterus, and the examination of the fluid, which differs from that of ovarian cystomata by coagulating spontaneously, and in containing muscle cells.

Uterine Moles.—Here, the history, uterine enlargement, examination of the discharge, and cervical dilatation, together with evidences from routine examination, would prevent any error.

Pelvic Cellulitis. Pelvic Peritonitis.—These are readily excluded by the acute history, less rounded form, immobility, and by puncture resulting in no fluid or only a little serous exudation. These masses, moreover, do not increase in size after the inflammation has once passed. Should perimetric inflammation complicate a small intrapelvic ovarian cystoma, the diagnosis would

be difficult and sometimes only possible after puncture and examination of the resulting fluid.

Pelvic Abscess.—The history, indistinct fluctuation, immobility, constitutional symptoms of retained pus, and puncture will eliminate doubt.

Pelvic Hæmatocele.—The sudden advent with acute symptoms, the subsequent retraction or suppuration, and examination of contents will decide.

Encysted Intra-peritoneal Effusion in Douglas's Pouch.—This could only be mistaken for a small intra-pelvic cystoma embedded in an exudation. The history and examination of the fluid contents would tell.

Cyst Connected with Spinal Cord.—Spina bifida pointing into the hollow of the sacrum, has been reported as being liable to be confounded. Examination of the contents would show it to be cerebro-spinal fluid, or at least not of the character of that of ovarian cystomata.

Fecal Accumulations.—Can be indented, putty-like, are accompanied by constipation, are small, and are removed by catharsis or enema.

Perityphlitis.—The consistency is firmer, the mass is situated in the right iliac fossa, has no connection with the generative organs, and gives a different history.

Enchondroma and Carcinoma of the Pelvic Walls.—These are rare, very hard, do not fluctuate, are fixed and immovable, and are thus readily differentiated.

b. When Large and Chiefly Abdominal in Position.—Inspection shows the abdomen to be distended, usually more or less markedly on one side, the superficial abdominal veins dilated, and the white lines due to stretching of the skin may be present.

Palpation shows this distention to be due to an encysted mass of fluid which gives the sensation of

firmness and elasticity, and fluctuation. No muscular contraction of the cyst-wall will be felt. The surface of the tumor often feels irregular and lobulated. The sensibility of the part of the abdominal wall supplied by the genito-crural nerve of the same side as the tumor, is said to be impaired.

Obesity, œdema, and spasm of the abdominal wall interfere with this part of the examination, but not usually enough to mislead.

Percussion yields, in the dorsal decubitus, dulness over the tumor, but at one of the flanks the note remains tympanitic; turning the patient upon the side, the relative positions of the areas of dulness and tympanitic resonance do not alter very much.

Auscultation is negative.

Mensuration shows the distance between the umbilicus and ensiform appendix, and between the anterior superior spinous process and umbilicus, to be different on the two sides; more difference occurs with multilocular than with unilocular cysts.

Vaginal touch informs us that the uterus is displaced and not usually enlarged, and we can usually feel the lower surface of the tumor, and often its attachments to the uterus.

Rectal touch with one or two fingers, or half the hand or the whole hand in the rectum, will confirm preceding.

Combined manipulation is very useful in determining these points and in estimating the size of the tumor.

The uterine sound gives us information in regard to the condition of the uterus and its relations to the tumor.

Aspirating or tapping and examination of the con-

tents. These are of the greatest value; they determine the existence and the character of the fluid.

Explorative incision should be practised when all other means of diagnosis have been exhausted and we are still in doubt; we should be prepared to do ovariotomy if the incision proves the existence of an ovarian cystoma.

Differentiation.—These large intra-abdominal ovarian cystomata must be differentiated from

Solid tumors of the ovary.
Cysts of the broad ligament.
Pregnancy.
Abdominal pregnancy.
Dropsy of the amnion.
Vesicular mole.
Hæmatometra.
Fibroid and fibro-cystic tumors of the uterus.
Ascites.
Encysted dropsy.
Parasitic cyst.
Subperitoneal cyst.
Retro-peritoneal sarcoma.
Omental tumors.
Tympanites—phantom tumor.
Fecal masses.
Dilatation of the stomach.
Distended bladder.
Tumors of the kidney.
Tumors of spleen.
Tumors of liver.

Many of these have been discussed in speaking of the smaller ovarian cystomata, and will now be omitted to avoid repetition. The additional conditions requiring differentiation are:

Normal Pregnancy.—After the uterus has become sufficiently enlarged to be above the pelvic brim, it would give the symptoms and the history of pregnancy, marked mammary evidences, the tumor is firm and non-fluctuating and has intermittent contractions, and we may be able to feel the fœtus. We find the cervix softened and the vagina congested, get ballottement, and after the twentieth week the fœtal heart-sounds, which are unmistakable.

Abdominal Pregnancy.—The history, attendant changes in the uterus, marked mammary signs, palpation, and hearing the fœtal heart would decide.

Dropsy of the Amnion.—Here we have the history of pregnancy, marked mammary changes, persistent amenorrhœa, movement of the cervix with the tumor, intermittent contractions of the uterus, more superficial fluctuation, and the difference in the character of the contained fluid to guide us. Amniotic fluid is albuminous and saline, and contains flat epithelial cells, fat-globules, and débris derived from the fœtus.

Hæmatometra.—The history, persistent amenorrhœa, movement of the cervix with the tumor, and especially obtaining a specimen of the contents, would decide.

Ascites.—In the dorsal decubitus, the surface of the abdomen is flattened and there is bulging laterally where the fluid gravitates, and over these parts dulness will be obtained; while above, where the intestines have floated, a tympanitic note is obtained; if the woman now lies upon the side, the intestines float to the top, and here we now get a tympanitic note, the fluid always gravitating to the bottom and giving dulness. We often have evidences of cardiac, renal, peritonitic, or hepatic disease, and additional symptoms due to these. The fluctuation is more superficial. The

fluid is clear, straw-colored, coagulable spontaneously, of a specific gravity of 1010 or 1015, and contains endothelial pavement cells, small quantity of pus, fat-globules, albumen, and salts; it it devoid of paralbumen and metalbumen, and of cylindrical cells.

When ascites complicates ovarian cystoma, especially if it be great in amount and the cyst small, much confusion in diagnosis may result.

Encysted Peritoneal Fluid.—This would present some difficulties. The previous history, the tumor being less rounded, having more diffuse boundaries, being more sensitive, and the examination of the fluid, usually suffice; in these cases, exploratory incision may be necessary.

Hydatid Cyst.—Echinococcus may develop in some part of the abdomen. The examination of the fluid, with discovery of hooklets, is diagnostic.

Subperitoneal Cysts.—These are rare and would be distinguished by examination of the contained fluid.

Retroperitoneal sarcoma is hard, nodular, non-fluctuating, and immovable.

Omental Tumors.—These are hard, nodular, often accompanied by malignant growths elsewhere, do not fluctuate, and have no connection with the uterus.

Tympanites and "phantom tumor" are distinguished by increased resonance everywhere, great elasticity, and disappearance after use of cathartics in the former, and anæsthesia in the latter condition.

Dilatation of the Stomach.—No confusion should arise after a careful physical examination.

Distended bladder is known by its peculiar form, dribbling of urine, by the history, and use of the catheter.

Tumors of the Kidney:

a. Hydronephrosis; usually is covered in front by

intestines; the right lies external to the ascending colon, the left behind transverse colon; is not connected with the organs of generation, grows from above downward and inward, often tumor in lumbar region; urine often contains albumen, blood, or pus; there may be urinary disturbances; puncture of the sac and examination reveal urine, except in very old cases, when the fluid may have lost the characteristics of urine.

b. Echinococcus presents the same characteristics, except in the changes in the urine; there exist the peculiar hooklets. The diagnosis of this and the preceding affection may be very difficult.

c. Movable kidney when large may at first be confounded; but it can be replaced, is not connected with the generative organs, does not increase markedly in size, is solid, and the kidney is absent from its proper place.

Tumors of the liver, especially abscess and echinococcus, might at first deceive; but the previous history, their growth from above downward, connection with the liver, movements with respiration, and separation from the generative organs will decide.

Tumors of the spleen are diagnosticated in like manner.

Diagnosis of Adhesions.—This is considered of much less importance at present than was the case formerly, since the existence of numerous adhesions is no contraindication to ovariotomy. The occurrence of considerable pain in the course of development of the tumor, immobility of the uterus and base of the tumor, or if the abdominal wall cannot be made to roll over the tumor, or does not do so with deep inspiration, leads us to suspect adhesions. But the diagnosis of these is often difficult and is not essential.

Diagnosis of the Length of the Pedicle.—This is desirable. If the tumor be high up out of the pelvis, the uterus very movable, and the finger can be passed around the cervix without meeting with the tumor, the pedicle is probably long. The opposite of these signs tends to indicate a short pedicle. Examination per rectum in the genu-pectoral position, the cervix being drawn down with the volsella, and feeling the pedicle as it passes from the angle of the uterus, will aid us very much.

Reference has already been made to the value of aspiration, tapping, and explorative incision as aids to diagnosis when doubt exists; though a certain amount of danger attaches to their employment, they should be made use of when necessary, since the danger of an operation in an unsuitable case which these diagnostic means would prevent, is still greater.

Aspiration is, when practicable, the best means of obtaining fluid for examination; it is usually practised through the abdominal wall, though it may also be effected per vagina or rectum. A hypodermic syringe and needle answer very well when the fluid is thin; it is the least dangerous method. When the contents will not flow through this small needle, we employ a larger one, or use Dieulafoy's aspirator—where the needle is of greater diameter, and the suction force stronger.

The dangers of aspiration are peritonitis, hemorrhage into peritoneum or cyst, septicæmia from decomposition due to admission of air, and injury to intestines or other viscera; these are reduced to a minimum, if we can use the ordinary hypodermic syringe.

Tapping is rarely done at present, either for diag-

nostic, palliative, or curative purposes, since the preceding method is vastly superior and less dangerous.

Exploratory incision is done with all the preparations of a case of ovariotomy, for the surgeon should be prepared to do this operation should the results of exploration warrant it. A small incision one or two inches long is made down to the sac; if any ascitic fluid be present, this is let out. One finger is now introduced and explores the abdominal cavity; a sound may be introduced into the uterus as a further aid. Some of the contents of the tumor may be evacuated in order to give more room for investigation. Should the disease be malignant or the adhesions very extensive, or the condition thought to be one not requiring ovariotomy, the peritoneal cavity can be washed out, and the wound closed and treated just as after an ovariotomy; the chances of recovery are very good: in ninety-four cases of exploratory incision, Lawson Tait had only two deaths.

Course and Prognosis.—If left to itself, the disease is almost universally fatal, the patient dying of gradual exhaustion, and the average duration being three years; a fatal result has taken place in less than one year, and, on the other hand, been delayed for fifteen years.

Occasionally the disease comes to a standstill idiopathically, from calcific degeneration of the walls of the cystoma or a twisting of its pedicle; or spontaneous cure may result from rupture into the peritoneum and absorption, or into one of the hollow viscera and discharge.

But such favorable terminations are exceedingly rare. The usual course is progressive, and fatal if uninterfered with. The causes of death are: Exhaustion, rupture of the cyst producing peritonitis, suppu-

ration or gangrene and septicæmia, hemorrhage into the sac, twisting of the pedicle resulting in gangrene and septicæmia, and intercurrent diseases to which their enfeebled state renders them more liable.

Treatment.—The use of drugs, excepting to put the woman in the best possible general condition, is never followed by any curative effects, and has now been abandoned. The same may be said of local counter-irritants, such as iodine, cupping, leeching, vesication, inunctions, etc.

Surgery alone affects the progress of this affection; and nowadays this surgery is limited almost exclusively to *ovariotomy*. But to render the subject complete, a brief survey of the surgical methods formerly in use will be given.

Aspiration is never curative; it may be palliative, and is often resorted to for the purposes of diagnosis.

Tapping is palliative and probably never curative. The woman is placed upon the side, and the trocar and canula introduced usually through the linea alba, midway between the umbilicus and the pubis. A many-tailed bandage around the abdomen is employed to exert even pressure, and the fluid is conducted beneath water by a long rubber tube attached to the canula, so as to prevent the entrance of air. After all the fluid has been withdrawn, the small opening is covered with adhesive plaster, and the woman kept quiet in the recumbent posture for several days. In certain cases, peculiarly adapted, the puncture may be made through the vagina.

The mortality after tapping is almost as great as that after ovariotomy, and the palliative effects usually of short duration; the dangers are from hemorrhage, septicæmia, peritonitis, and wounds of viscera. Never-

theless, it may be of occasional service in alleviating the symptoms due to interference with some important function as a result of rapid accumulation of the fluid, when pregnancy, firm and extensive adhesions, or marked constitutional debility, call for an avoidance or postponement of ovariotomy.

Tapping and subsequent drainage have been resorted to, both through abdomen and vagina; it is best done per vagina. It is only admissible in those cases which have such extensive pelvic adhesions, that the separation from surrounding parts which would be required in ovariotomy, would be considered dangerous. After tapping, the cyst is washed out, a drainage-tube inserted, and the washing repeated when necessary.

Tapping with subsequent injection of iodine is very risky, not curative, and now never used.

Electrolysis does not cure, is not even palliative, and is rarely now resorted to.

The reported cures of ovarian cysts by the use of the methods just enumerated, were probably cases of cysts of the broad ligament—these are often cured by merely tapping them.

Parovarian Cysts.

These result from a distention of one or more of the parovarian tubes. They are nearly always uniocular, grow slowly, frequently rupture spontaneously and do not always refill.

They are distinguished from ovarian cysts by their situation between the folds of the broad ligament, below the Fallopian tubes and above the ovary.

They have a thin wall lined with a single layer of columnar, ciliated epithelium; they contain a fluid

which is thin, colorless, sp. gr. 1002–1008, no albumen and no paralbumen.

They seldom cause disturbances unless they assume a papillary form, a change which has occurred in some cases after tapping. They do not attain a large size.

They were formerly treated by puncture; but as there may be an error in diagnosis, or they may become malignant after tapping, it is best to extirpate them by laparotomy, especially since this operation has become so common and its danger has become lessened so much.

CHAPTER XI.

AFFECTIONS OF THE OVARIES (*concluded*).

Ovariotomy: vaginal, abdominal—Inflammations of the ovary—Acute ovaritis—Chronic ovaritis—Battey's operation—Hæmatoma of the ovary.

Ovariotomy.

DEFINITION.—The removal of diseased ovaries.

INDICATIONS.—When the tumor from its size interferes with the comfort and health of the woman, ovariotomy is indicated. As long as it does not do this, there is no necessity for it.

CONTRAINDICATIONS.—The only absolute contraindications are malignancy and very extensive and firm adhesions. Suppuration or gangrene of the cyst, peritonitis, septicæmia, and hemorrhage, caused by the tumor, are no contraindications to its removal.

PERIOD AT WHICH OPERATION SHOULD BE UNDERTAKEN.—If the cyst be small and easily removed by vagina, this should be done at once. If it has grown so as to be abdominal in situation, it was formerly believed to be best to wait until the woman's comfort and health were somewhat interfered with. At the present day, however, gynecologists believe in operating as soon as the tumor has reached sufficient size to be diagnosticated, since perfected antiseptics and improved methods of operating have made the operation much less formidable than it was formerly.

Conditions Favorable to the Operation.—Thomas gives the following:

Clearness and certainty of diagnosis.

Good constitutional condition.

Patient being hopeful and desirous of operation.

Paucilocular character of cyst.

Absence of much solid matter in its structures.

Abdominal walls not very thick.

Absence of strong pelvic adhesions.

Conditions Unfavorable to the Operation.—Of these Thomas gives:

Obscurity as to diagnosis.

General constitutional impairment.

Gastric and intestinal disorder.

Depression of spirits.

Presence of much solid matter in tumor.

Extensive and firm adhesions to viscera (and walls of pelvis).

Great thickness of abdominal walls.

Dangers.—Chiefly from peritonitis, septicæmia, shock, hemorrhage, and exhaustion.

Mortality.—Whilst previous to 1860 the mortality was above fifty per cent., it has gradually been reduced; especially has this been the case in the last few years, after the introduction of antisepsis into surgery. The mortality at present is very low. In 1886 Mr. Tait operated on 63 cases with only 1 death; other English surgeons—Keith, Wells, Bantock—have equally good results, as have also the surgeons of this country.

Varieties of Operation.—There are two forms of ovariotomy:

(1) Vaginal.

(2) Abdominal.

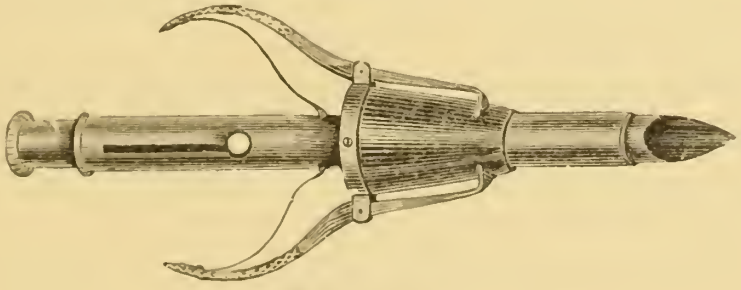
Vaginal Ovariotomy.—This is applicable to small

cysts, which are intra-pelvic, in Douglas's pouch and free from adhesions, when the uterus is freely movable or retroverted.

It is contraindicated where the cervix is held back, or the fundus held forward by rigid tissues; also, where the ovaries are bound down by masses of lymph high up laterally or anteriorly in the pelvis; also, where larger than an orange and adherent, or even if it be not adherent, when it is larger than a child's head.

The steps of the operation as follows: The patient having been prepared for operation (same as for abdominal ovariotomy), placed in dorsal decubitus, the vagina and surrounding parts are thoroughly disinfected, the cervix drawn down by a tenaculum and held by a thread drawn through it; the cervix is then drawn forward and the perineum firmly retracted. The posterior vaginal wall is seized a little below the vaginal junction (to avoid hemorrhage) and snipped through in the median line for one and a half inches; this opening extends through the peritoneum; if necessary, it may be enlarged with the fingers. Hemorrhage is usually slight and can be controlled by forceps or ligature. Two fingers are then introduced through

Fig. 30.



Wells's trocar.

the opening into the cul-de-sac, and the ovary seized; it is usually followed by the tube. A needle is then

passed through the broad ligament and the pedicle tied in two halves, the sac cut off and the pedicle returned or retained in the wound. If the cysts are too large to be drawn through the opening they should previously be aspirated. (Fig. 30.)

The cul-de-sac is next carefully sponged out. Then stitches are introduced into the lips of the incision, including both peritoneal and vaginal edge, and if necessary, a drainage-tube can be introduced into the lower angle of the wound. Around this tube, the vagina is packed with a long piece of iodoform gauze, leaving the end project; finally a dry dressing is placed over the vulva. The tube is removed at the end of twenty-four hours, and the tampon at the end of two or three days. The after-treatment is the same as in the abdominal method.

Abdominal Ovariotomy.—This is the ordinary operation of ovariotomy, which should be resorted to except in those few peculiar cases which are best operated upon by the vaginal method.

Preparation for the Operations.—The general health should be put into the best possible condition, by the use of iron, quinine, nux vomica, and other tonics, fresh air and moderate exercise, and a nutritious diet. The woman's surroundings should be bright, and her mind kept cheerful.

The operation should be performed in a private house, if possible, preferably in the country; if done at a hospital, it should not be performed in crowded wards, but rather in out-houses or tents.

During the week previous to the operation, the patient should receive a warm bath daily, and the bowels should be kept open; just before the operation the rectum and bladder are emptied.

The temperature of the operating-room should be 75° to 80°. An efficient nurse must be in attendance. The woman should be clothed in flannel drawers and wrapper, and be anæsthetized outside, and be brought into the operating-room in an unconscious condition, so as not to see the display of instruments, etc. She should be laid upon the back, on a table of suitable height and not too wide, several layers of blankets being interposed. The table is placed before a window affording good light, with the feet of the patient toward the window; the lower extremities are kept warm by the use of flannel, and, if necessary, hot bottles.

The Use of Listerism in Ovariotomy.—Though some ovariotomists (Wells, Thornton, Thomas) adhere strictly to Listerism, a great many have given it up (Tait, Keith, Bantock); the results of the latter are equally as good as those of the former, whilst the disagreeable effects of the spray upon the operator, and the risk of carbolic acid absorption to the patient, are removed. The favorable results of ovariotomy at present are probably due to the strict *cleanliness—asepsis*—which is insisted upon, whether or not Listerism be used. Most ovariotomists make use of a modified Listerism, and have omitted the use of the spray, but retained the other details.

Instruments.—For a non-complicated case, the following are required: One scalpel; one director; two retractors; one pair of scissors; twelve pair of pressure forceps; one trocar (medium sized, curved or straight); glass drainage tubes, artery forceps; a soft-rubber catheter; a small rectal tube; one No. 6 male sound; two small tenacula: one large tenaculum; two Nélaton forceps; one needle-holder; one sponge-forceps;

needles of various sizes (straight and curved); one dozen hand sponges; three or more flat sponges; one dozen small sponges for abdominal cavity (to be used in the forceps); silver wire, No. 27; silk, catgut, and gut of silkworm, of various sizes; kangaroo gut, for intestine if necessary; rubber plaster; iodoform; iodoform gauze; pure carbolic acid for solutions; tablets of bichloride of mercury (for solutions); and trays for the instruments. In addition it is well to have in reserve a Paquelin cautery; a vulsellum forceps; clamps for pedicle (if unusually large); écraseur; elastic ligatures.

Steps of the Operation.—These may be enumerated as follows:

1. Abdominal incision.
2. Evacuation of contents of cyst.
3. Drawing out of the evacuated cyst from the abdomen, and treatment of adhesions.
4. Separation of cyst at its pedicle, and securing the latter.
5. Examination of other ovary.
6. Cleansing the peritoneum.
7. Drainage, when necessary.
8. Closure of abdominal wound.
9. Dressing of abdominal wound.
10. After-treatment, in normal and in complicated cases.

Four or five assistants are necessary. Sponges and artery forceps should be counted before and after the operation, so as to be sure none are left in the abdominal cavity.

The surface of the abdomen is thoroughly scrubbed with soap and water, and then washed with an antiseptic solution. A new towel, wrung out in solution of

carbolic acid (1 : 60) should be placed over the pubes and another one above the point at which the operator commences his incision.

1. *Abdominal Incision.*—The operator standing to the right side of patient, an incision four to five inches long is made in the median line, beginning two inches below the umbilicus, and having its lower limit about an inch above the pubis; the shorter the incision through which the operation can be done properly, the better. This incision passes through skin, fat, linea alba, fascia transversalis, and extraperitoneal areolar tissue. Bleeding points should now be treated by pressure, or, if necessary, ligatured. Hemorrhage having been stopped, the peritoneum is caught up by forceps or tenaculum, opened, a grooved director passed under it, and upon this it is slit open, for the length of the incision. The cyst being now exposed, the next step is

2. *Evacuation of Contents.*—The patient is now turned upon the side, and a long curved trocar and canula, of which there are many varieties, are introduced, and the fluid allowed to run off; to prevent the latter from getting into the peritoneal cavity a soft sponge is held against the abdominal wall below the incision ; pressure should be exerted against the abdominal wall to facilitate the flow.

To evacuate other cysts, the trocar and canula are introduced into them obliquely from the emptied one; if there are a great many cysts or the contents are colloid and will not run from the canula, the hand is introduced and the subdividing cyst wall broken up, and at the same time the contents removed; care must be taken not to allow the peritoneal cavity to become soiled—this can be obviated by drawing the edges of

the opening into the cystoma forward with a pair of strong forceps, and pressing the edges of the abdominal wound firmly against the cyst wall.

When sufficient of the contents have been evacuated to allow part of the sac to be drawn out, the incision into the cystoma is enlarged, and thus the flow expedited.

During the progress of the operation, instruments are kept in 1 to 40 and sponges in 1 to 60 carbolic acid; for irrigating the peritoneal cavity a 1 per cent. or 1 to 60 solution is employed, or a solution of corrosive sublimate (1:2000 to 5000).

Drawing out of the Evacuated Cyst from the Abdomen, and Treatment of Adhesions.—The removal of the sac is easily effected when no adhesions exist; or when slight adhesions exist, these are readily ruptured by steady and firm traction upon the sac seized by the fingers. Should an adhesion resist these efforts, it must be exposed and separated by the fingers, scissors, or cautery wire; if it be a long one, it may be doubly ligatured and an incision made between.

Where the adhesions are more universal, the hand may be passed into the sac and its posterior wall seized and everted, and then the adhesions severed. Where the adhesions cannot be removed by any of these means, it may be necessary to leave the adherent portions of the sac-wall and cut away the rest; or, where considerable tissue would be left in this way, a glass tube can be placed within that part of the cyst, the edges drawn around this tube, and the latter being drawn through the abdominal wall, drainage is secured.

Or, *Miner's method of enucleation* may be resorted to with advantage; the tumor is enucleated from its peritoneal investment by introducing the fingers through

an opening made into this peritoneal covering; the remaining sac is closed and hemorrhage from its inner surface checked by persulphate of iron; if large, the sac from which the cystoma has been enucleated is tied around a drainage-tube, or treated by extraperitoneal clamps, or it can be treated intraperitoneally by ligature or cautery.

The bleeding resulting after severing adhesions should be controlled by pressure, cautery, or, if necessary, fine carbolized silk ligatures.

4. *Separation of the Cyst at its Pedicle, and Securing the Latter.*—During the examination of the pedicle, the part of the cyst immediately next to the former may be constricted by Dawson's temporary clamp or a stout ligature, and the rest cut off.

Then arises the question of how best to treat the pedicle; there are two methods: extraperitoneal and intraperitoneal.

The *extraperitoneal* method consists in compressing the pedicle with one of the many clamps devised for this purpose, in cutting off the sac, and leaving the clamp outside and the pedicle between the edges of the abdominal wound. Or, instead of the clamp, we may ligate, and fasten the pedicle into the edges of the wound by long pins or by the sutures used in closing the abdomen.

The extraperitoneal method is only applicable to cases in which the pedicle is long enough and not too thick. Its great advantage consists in the stump of the pedicle being exposed, hemorrhage is at once recognized and easily checked. Its disadvantages are that it is inapplicable to too short or too thick pedicles, that it exerts traction upon the uterus, may cause

ventral hernia or sloughing beneath the abdominal surface.

The *intraperitoneal* method consists in the return ot the pedicle into the abdominal cavity after removing the sac and checking hemorrhage by ligature or cautery.

To use the cautery, a special temporary cautery clamp is needed—one in which the surface next to the skin of the abdomen is of ivory, so as not to conduct heat; the pedicle having been drawn out and fixed in the clamp, the cautery is applied until the stump is seared down to the level of the clamp; after this, if there is no hemorrhage, the pedicle is dropped back into the peritoneum.

To use ligature, thin but strong carbolized Chinese silk is used (No. 3 or 4), threaded on a blunt needle and made to transfix the pedicle; in this way we have two ligatures through the pedicle, each of which is tied firmly; the cyst is cut off half an inch above; the pedicle is examined for bleeding points, which if present should be secured, the ligature is then cut short, and the pedicle returned.

The intraperitoneal method is the one which meets with most favor at present; it is the only method (excepting enucleation) which can be employed when the pedicle is very short or very thick; even in other cases it is now the preferred method. In a letter to the writer in answer to inquiry, Dr. Thomas kindly stated: "I now adopt the intraperitoneal treatment of the pedicle universally, unless some excellent reason exists for making an exception to the rule" (July 11, 1885).

Mr. Lawson Tait (*Medical Record*, January 3, 1885) considers the clamp the chief cause of higher mortality

in his early cases of ovariotomy; in support of this, he gives the following figures:

	Cases.	Deaths.	Mortality per cent.
Clamp (Listerian)	36	9	25.
Clamp (non-Listerian)	26	7	27.
Ligature (Listerian)	30	2	6.6
Ligature (non-Listerian)	313	15	4.8
Total	405	33	8.15
Extraperitoneal cases	62	16	25.7
Intraperitoneal cases	343	17	4.58

5. *Examination of the Other Ovary.*—This should now be resorted to. If it be healthy or contains simply a few small cysts, and the woman is still far from the menopause, it should not be removed; the cysts may be punctured. But if it is three or four times its natural size and cystic, removal is usually indicated; the pedicle is treated similarly to that of the chiefly affected side.

6. *Cleansing the Peritoneum.*—The "peritoneal toilette," as the Germans express it, is of the greatest importance; soft sponges wrung out of warm carbolized water (1 to 60), should remove all serum and blood and thoroughly cleanse the peritoneal cavity. No bleeding points should be left.

7. *Drainage* is not needed in simple cases. In cases where, from the retention of a part of the sac or from other causes, it is thought probable that considerable serum and other material will be thrown out, drainage should be employed.

A curved glass tube is passed through the wound and fixed there; it curves down into the pelvis and its external end is protected by a cork; through this tube the cavity can be washed out when desired. Thomas

has improved on this by introducing a double tube, one for entrance and the other for exit of the cleansing fluid; in this way the peritoneal cavity can be washed out with hardly any disturbance of the patient, should symptoms of septicæmia render irrigation desirable.

8. *Closure of Abdominal Wound.*—This is effected by a set of deep silver sutures one-half inch apart, bringing the whole thickness of the abdominal wall together, including the peritoneum; in addition superficial sutures of silk bringing together the cutaneous edges, should be used.

9. *Dressing of abdominal wound* is usually done in the Lister fashion—a layer of protective, a layer of gauze wet with 1 to 40 carbolic solution, eight layers of carbolized gauze, between the seventh and eighth of which a piece of Mackintosh cloth is placed. Over this antiseptic cotton is laid, and the whole secured by flannel bandages.

10. *After-treatment in Normal and in Complicated Cases.*—After the operation, the woman should be removed to another room if possible, put to bed and covered warmly, and given a full dose of opium. The room should be well ventilated and its temperature kept at 65° to 70°.

After twelve or twenty-four hours, the temperature of the woman may rise to 102° or even 104°; but this is the result of the operation, and in ordinary cases is soon succeeded by a fall to the normal.

Pain should be controlled by opium in sufficient quantity. The bladder should be evacuated by the catheter for the first few days; the bowels are kept constipated for a week, after which enemata may be used. Diet should consist entirely of milk, beef-tea, and broths for one week. Should the heart require stimu-

lation, alcohol in the form of brandy, wine, or champagne is indicated.

If the case is progressing favorably and the dressing not soaked through by the discharges, it may remain undisturbed for a week; should it have become soiled, it is to be changed as often as necessary. The stitches are to be removed gradually at the end of one week, if union is perfect.

The *complications* resulting from the operation may be:

Shock.

Secondary hemorrhage.

Hyperpyrexia.

Septicæmia.

Peritonitis.

Shock is treated by warmth to extremities, lowering the upper part of the body, alcohol and ammonia, or ether by mouth, rectum, or hypodermatically.

Secondary hemorrhage usually occurs during the first twenty-four hours. If from an extraperitoneal pedicle in clamp, it is readily controlled; if intraperitoneal, the wound must be reopened and ligatures applied.

Hyperpyrexia may be due to septicæmia, peritonitis, or absorption of carbolic acid, or may occur without these causes. It is best controlled by the ice-cap of rubber or tin tubing, the abdominal cold-water coil, or the use of Kibbee's cot.

Septicæmia does not usually make its appearance until several days after the operation. If there is any accumulation in the peritoneal cavity, it should be let out and the latter washed out with weakly carbolized water through the drainage-tube, if one has been left in; it may even be advisable to reopen the incision sufficiently to introduce a tube for this purpose. Be-

sides this local treatment, stimulants and quinine should be employed.

Peritonitis, if traumatic, usually develops early—during the second or third day; cases occurring later than this are usually of the septic variety. Opium in large doses up to tolerance should be used, fluid diet, reduction of temperature by means already alluded to; if septic origin of the disease is suspected, the peritoneal cavity should be washed out. Local counter-irritation may be used if agreeable to the patient.

Inflammations of the Ovary. Oophoritis.

These may be:

1. Acute ovaritis or oöphoritis.
2. Chronic ovaritis or oöphoritis.

Acute Ovaritis.

Definition.—An acute inflammation of the follicles, or of the stroma, or of both tissues of the ovary.

Etiology.—Parturition and abortion; the most common causes, especially in septic cases.

Pelvic peritonitis.

Pelvic cellulitis; these two diseases are not infrequently complicated by acute ovaritis.

Gonorrhœal infection, either sympathetically or by causing pelvic inflammation.

Disturbances of menstruation.

Injuries; direct or to the uterus.

Excessive coition.

Acute febrile diseases, such as cholera and the exanthemata.

Certain poisons, such as arsenic and phosphorus.

Pyæmia and septicæmia.

Pathology.—There are two forms :

a. Follicular or parenchymatous, in which all or the greater part of the inflammation affects the follicles, and especially those of the periphery; these become enlarged, distended with turbid or purulent fluid, and the cells of the membrana granulosa become more granular and fatty and break down. The entire ovary is moderately enlarged. Resolution usually takes place, but sterility (if the ovaritis be double) may result.

b. Interstitial ovaritis, in which there is an infiltration of the stroma with serum and pus cells; the latter may be diffuse or circumscribed. The ovary is considerably enlarged. This form may terminate in resolution, or in the formation of abscess. This variety is most frequently due to the puerperal state, pyæmia, and septicæmia.

These two varieties are usually more or less associated, but one or the other form predominates.

Symptoms.—Since an uncomplicated case of acute ovaritis is uncommon, it is difficult to dissociate the symptoms of the accompanying affection. There is

Severe pain in one or both iliac fossæ, radiating backward.

Tenderness on pressure over one or both iliac fossæ.

More or less prostration.

Fever and its accompaniments.

Perhaps rigors.

Physical Signs and Differentiation.—By bimanual examination (in a simple case) we would feel the ovary enlarged, very tender, and distinct from the uterus. But, since it is most often complicated, the diagnosis and differentiation from the conditions causing and

resulting from it may be difficult and often is impossible.

Course and Prognosis.—In the course of several days resolution often takes place; but suppuration and abscess may occur, and the pus be discharged into the peritoneum, or by the formation of adhesions, through rectum, intestines, bladder, or vagina. Or, the patient may get well, with the ovary retained in an abnormal position by adhesions. Sterility may result from double ovaritis.

Treatment.—Absolute rest; fluid diet; control pain by bromides and opium; the latter by mouth or suppositories. Leeches may be applied to the groin or iliac region, and hot applications over the inflamed organ; heat may also be applied by means of hot vaginal injections. Blisters over the ovary may be useful. We can do nothing after the abscess has formed, except to keep patient quiet, so as to prevent its bursting into the peritoneal cavity, and waiting for adhesions to form, so that it will be discharged by one of the hollow viscera.

Chronic Ovaritis.

Definition.—A chronic inflammation of one or both ovaries.

Occurrence.—Quite frequent.

Etiology.—Same as that of the acute variety, which form it may follow; it is often a complication of uterine disease, and often results from prolapse.

Pathology consists in a degeneration and destruction of the follicles and increased production of connective tissue, which may either leave the organ enlarged, or, as a result of its contraction, small and cirrhotic.

Symptoms vary very much in severity, and are not definite. Any of the following may be present:

Pain over one or both ovaries.

Pain on coition and defecation.

Mammary pain.

Disorders of menstruation.

Sterility.

Hysteria and other nervous phenomena.

Interference with the general health.

Complications.—There are often present:

Prolapse of the ovaries.

Inflammations of the uterus.

Displacements of the uterus.

Diseases of the Fallopian tubes.

Physical Signs.—Same as in acute form; tenderness is less acute.

Course and Prognosis.—Though some cases recover completely, many are very obstinate, and, despite every treatment, become steadily worse.

Treatment.—Rest during the menstrual period; little or no sexual excitement. Vaginal douches of hot water; also glycerin-soaked vaginal tampons, and painting the roof of vagina with iodine every week. Blisters, nitric acid, issues, iodine, or other counter-irritants, should be used persistently over the diseased organ.

The woman should be put in the best general condition by fresh air, change of climate, nutritious food, tonics, etc., and the use of bromides for nervous symptoms.

Should displacement of the uterus or prolapse of the ovary be present, these should be remedied.

The occurrence of pregnancy often effects a cure.

Should all these methods have been tried persistently

and have failed, and the condition still give rise to great pain and annoyance so as to interfere with the woman's health, removal of the ovaries (Battey's operation), or of the ovaries and tubes (Tait's operation, *vide* p. 246) may be justifiable; Tait's operation should be chosen when the tubes are also involved, as they very frequently are in this condition.

Battey's Operation.

Definition.—Removal of both ovaries to arrest ovulation.

Synonyms.—Oöphorectomy, female castration, spaying, and (incorrectly) normal ovariotomy.

Indications.—Intolerable dysmenorrhœa.

Excessive menorrhagia.

Excessive hemorrhage from uterine tumors.

Chronic ovaritis; obstinate, and with severe symptoms.

Prolapsed ovaries which cannot be kept in place, or which are fixed.

Presence of ovaries with absence of uterus or vagina.

Hystero-epilepsy dependent upon ovarian irritation.

Insanity dependent upon ovarian irritation.

Other neuroses dependent upon ovarian irritation.

Results.—In many cases the operation accomplishes a cure; but it must be remembered that it is dangerous, often difficult, and in many cases of doubtful utility; cases of insanity, mania, and melancholia have been reported as directly following the operation; so that it is only to be resorted to as a last resort, and as an alternative to fatal exhaustion or a life of suffering.

Mortality.—Of 120 cases reported (*American Journal of Obstetrics*, etc., January, 1880), 28 proved fatal—22

per cent. Hegar operated 42 times, mortality 16.6 per cent. Tait removed both ovaries 101 times, mortality 5 per cent. In 54 cases, Battey reports: cured, 33; much improved, 8; little improved, 5; not improved, 8. There was complete menopause in 50, and pseudo-menstruation in 4; in two of the latter the tubes were also removed, in the other two they were not removed.

The decrease of the mortality of late years indicates that with increased experience the dangers of the operation become less. When many adhesions exist, the operation is difficult, and the mortality high.

Removal of the ovaries does not remove womanly attributes nor diminish sexual appetite, and in some cases menstruation has continued.

Methods of Operating.—*a.* By vagina—Elytrotomy.

b. By abdominal section—Laparotomy.

a. By Vagina.—The woman is placed on the left side, in Sims's position, or in an exaggerated lithotomy position, anæsthetized, speculum introduced, and the cervix drawn down to the vulva. An incision is now made with the scissors through the posterior vaginal wall behind the cervix into Douglas's cul-de-sac, one ovary found with the finger and drawn down into the vagina with the forceps—this is facilitated by supra-pubic pressure. The ovary is now secured by a silk ligature, and cut or écraseured off, and the stump returned into the peritoneal cavity; the other ovary is removed in the same manner.

The opening may be left to close gradually, or a drainage-tube may be inserted and the wound stitched up; irrigation twice daily, and the after-treatment of ovariotomy is carried out.

When the ovaries are low down, readily felt, and free from adhesions, this is the better operation, but

in other cases laparotomy is preferable; in general, elytrotomy is more difficult and less certain than laparotomy.

b. By Abdominal Incision.—The woman being upon the back and anæsthetized, a median incision from the symphysis pubis upward for four inches, passing through the peritoneum, is made; bleeding is arrested by pressure or by ligatures. Passing the fingers in and guiding them along the uterus and Fallopian tube, the ovary is grasped and brought through the incision, ligatured with thin carbolized silk, and cut off; the pedicle is returned in a short time—after hemorrhage has ceased. The other ovary is similarly treated, the peritoneal cavity thoroughly cleansed, and the abdominal incision closed; if the operation has been an easy one drainage will be unnecessary.

The details of the operation and its after-management are similar to those of ovariotomy. This operation is more difficult than that of ovariotomy.

Hæmatoma or Apoplexy of the Ovary.

Definition.—An effusion of blood into the substance of the ovary.

Occurrence.—Not frequent; usually occurs after puberty.

Etiology.—It has been observed after fevers, purpura, and rheumatism; it is sometimes the result of vicarious menstruation. Beside these, the predisposing and exciting causes of pelvic hæmatocele also operate in this condition.

Pathology.—It may take place at any time, but usually it occurs at the menstrual period. The distention may be so great as to cause rupture of the ovary

and passage of the blood between the layers of the broad ligament, or into the pelvic cavity, constituting pelvic hæmatocele. Pelvic peritonitis is often caused by this affection, even without the production of pelvic hæmatocele.

Symptoms.—Similar to those of pelvic hæmatocele; severe localized pain and symptoms of abdominal shock.

Physical Diagnosis.—If with these symptoms we discover a tumor limited to the region of the ovary, which enlargement has come on suddenly, we may suspect this condition.

Differential Diagnosis.—It must be differentiated from the rupture of an extrauterine fruit sac and pelvic peritonitis. This is often difficult, and may be impossible.

Course and Prognosis.—Peritonitis may follow; or the tumor may diminish in size and the blood be absorbed. Atrophy of the ovary often follows. The prognosis is fairly good.

Treatment.—That of pelvic hæmatocele; should peritonitis result, this should receive proper attention.

CHAPTER XII.

AFFECTIONS OF THE PELVIC CONNECTIVE TISSUE.

Pelvic cellulitis—Pelvic peritonitis—Pelvic hæmatocele and hæmatoma.

These include:

Pelvic cellulitis.

Pelvic peritonitis.

Pelvic hæmatocele and hæmatoma.

Pelvic inflammation is the term under which many authors group both cellulitis and peritonitis. It is, however, more proper to consider them separately. Doubtless, they are never completely distinct, for with cellulitis there is usually some peritonitis, and with peritonitis there is generally some cellulitis, since these structures are so intimately associated. But one or other of these conditions will be found to preponderate, and the diagnosis is made accordingly; although it must be confessed it is often difficult and sometimes impossible to distinguish between them during life.

Pelvic Cellulitis.

Definition.—An inflammation involving chiefly the cellular tissue of the pelvis.

Synonyms.—Periuterine cellulitis, parametritis, periuterine phlegmon, pelvic abscess.

Occurrence.—It is of frequent occurrence, especially in connection with the puerperal state; it is considered infrequent in the non-puerperal condition.

Etiology.—Parturition or abortion—in these cases, which are by far the most frequent, the direct cause is thought to be absorption of septic matter.

Inflammation of the uterus.

Inflammation of the ovaries and tubes.

Excessive venery.

Exposure to cold during menstruation.

Operations upon the generative organs.

Direct injury from sound, pessaries, caustics, tents, or blows.

Pathology.—The body of the uterus is firmly connected with the peritoneum, no connective tissue being between them. In this affection, the tissue involved is situated in the folds of the broad ligament and immediately around the cervix. The connective tissue of the broad ligament is the part most frequently affected; usually it is confined to one side. More rarely, it may be limited to the areolar tissue on one or other side of the cervix.

The inflammation shows first marked congestion and then an infiltration of serum, fibrin, and new connective-tissue cells, with a few pus globules. After this, resolution may occur, and the exudation be absorbed; or suppuration and abscess may result. The abscess may discharge through the vagina, rectum, bladder, urethra, or uterus, or through the abdominal wall, perineum, or saphenous, obturator, or sacro-sciatic openings, or even into the peritoneal cavity.

The uterus is usually found displaced; disease of the ovary and tubes is often found associated.

Symptoms.—Invasion may be acute or gradual.

Most cases begin *acutely* with

Chill; this may be absent.

Fever (103° to 104°) and its accompanying symptoms—anorexia, headache, nausea and often vomiting, rapid pulse (110 to 130), and increased frequency of respiration.

Prostration.

Pain in pelvis, sometimes radiating to back or down thigh.

Thigh often drawn up on affected side.

Pain in urination and defecation.

When the invasion is *insidious*, the symptoms are:

General malaise; showing itself in a feeling of weakness, anorexia, headache, and nausea.

Slight fever,
Pain in pelvis,
Flexion of thigh,
Urinary disturbance,
Rectal disturbance,
} as in acute cases.

Course.—Whether the invasion be sudden or gradual, the symptoms soon become the same, and assume a chronic form, since resolution is always slow.

Should resolution not take place and *abscess* result, the *symptoms of suppuration* are added; these do not usually appear before a week or two after the invasion, often after a longer period; they consist of

Chills, or chilly sensations.

Fever, followed by sweating toward evening.

Anorexia.

Nausea, sometimes vomiting.

Headache.

Diarrhœa.

Slight jaundice (sometimes).

Breath may be sweet and sickening.

These symptoms persist until the pus escapes spontaneously, or through interference.

When resolution occurs, the symptoms subside gradually and the patient gets well; but the mass of exudation may persist for some time additional before completely disappearing.

Physical Signs.—By examining per vagina, rectum, and bimanually, we find tenderness over the hypogastrium, and feel a distinct fulness or a distinct mass of exudation to one side of the uterus or in the broad ligament; occasionally this extends as far as the iliac fossa, and rarely it occurs behind or in front of the uterus. The mass is sensitive to pressure; it pushes the uterus over to the opposite side; when resolution begins and the exudation contracts, the uterus is drawn over to the same side.

If abscess has resulted, we get fluctuation—distinct or obscure; the use of the hypodermic syringe will aid in doubtful cases.

Too prolonged or rude examination may set up pelvic peritonitis.

Differential Diagnosis.—It may be confounded with:

Pelvic peritonitis.

Uterine fibroids.

Small intrapelvic ovarian cystoma.

Pelvic hæmatocele or hæmatoma.

Extra-uterine pregnancy.

Differential diagnosis between
Pelvic Cellulitis and *Pelvic Peritonitis.*

1. The inflammation affects the cellular tissue chiefly.	1. The inflammation affects the peritoneum chiefly.
2. The effusion is usually confined to one side of the uterus, and bulges into the fornix.	2. The effusion is more general, around the uterus, and does not bulge into the fornix; it may bulge behind the uterus; it produces a hardening of whole roof of pelvis.
3. Less pain and tenderness.	3. Excessive pain and tenderness.
4. Only one leg is drawn up, if any.	4. Both legs usually drawn up.
5. Vomiting less frequent.	5. Vomiting more frequent.
6. Constitutional symptoms less marked.	6. Constitutional symptoms more marked.
7. Uterus is more movable.	7. Uterus is less movable.
8. Uterus displaced to one side.	8. If displaced at all, it is to the front.

But although these tables look very well on paper, yet clinically we are often unable to distinguish between the two, and must often diagnosticate pelvic inflammation.

Uterine fibroids do not give an acute history, are firmly connected with the uterus, are rounder, painless, and free from tenderness, and are movable. Should they become inflamed, however, the differentiation would be more difficult.

Small intrapelvic ovarian cystoma is more movable, rather higher up, does not bind down uterus, gives no acute history, and puncture reveals ovarian fluid.

Pelvic hæmatocele occurs suddenly, history is different, there are symptoms of loss of blood, and usually hemorrhage from the uterus; the tumor is soft at first,

and then hardens (unless suppuration occurs), whilst in cellulitis the hardness either disappears or softens.

Extrauterine pregnancy should rarely be confounded. The history of pregnancy, the mammary and uterine changes, the congestion of the genitals and the progress of the case, would distinguish. There would be no acute symptoms until rupture, and then the symptoms would be those of shock.

Complications.—These are quite frequently present, and include:

Pelvic peritonitis.

Ovaritis.

Salpingitis.

Endometritis.

Uterine displacements.

Results.—In the most favorable cases, the acute symptoms subside in two or three weeks, and with this resolution takes place, and the patient begins to convalesce; in two or three week more, she is entirely well, and the exudation has disappeared.

Very often the acute symptoms disappear, but the exudation still remains, and it is absorbed very slowly, and during this time the woman is not entirely well; this period may last from two to three months.

In still other cases abscess results; this may be evacuated directly by the various channels already mentioned; or there may result one or more long fistulous openings which interfere with the free evacuation of the pus, and in this way suppuration is prolonged by the formation of a pyogenic membrane upon the interior of the sac. Finally, the mass may become riddled with small abscesses, and then the case becomes very unfavorable and chronic.

As a consequence of cellulitis, permanent displace-

ments of the uterus and their symptoms, atrophy, chronic inflammation or destruction of one or both ovaries may result; or the Fallopian tube may become inflamed, and stricture and its results take place.

Prognosis.—From what has just been said, it will appear that although, as far as life is concerned, the prognosis is good—very severe infectious cases, occurring after parturition, may be fatal—yet neither the duration nor the consequences of the disease can be foretold; hence the prognosis as to complete recovery must be guarded.

Treatment.—May be divided into:

1. General.
2. Local.
3. Treatment of pelvic abscess.

1. *General Treatment.*—The woman should be kept quiet, and absolute rest enforced; the urine may be drawn with the catheter if the woman cannot void it in the recumbent posture. The bowels are allowed to remain constipated for the first few days, and then moved by gentle enemata, or a mercurial or other non-irritating purge (such as castor oil, Rochelle salt, compound licorice powder, etc.). Diet should consist of milk and beef-tea. Alcoholic stimulants may be required for the heart's action. The temperature does not usually require reduction; but should it become excessively high, aconite in drop doses, quinine, or sponging the body, may be resorted to. Opium by mouth, rectal enemata, suppositories, or hypodermatically, in quantities sufficient to control the pain, should be given.

After the acute symptoms have passed, and the woman is convalescing, and the induration being absorbed, or the abscess discharging, the diet should be

nutritious; iron, quinine, and nux vomica should be administered, and a small quantity of wine given with meals.

2. *Local Treatment.*—At the very beginning, the application of ice or of leeches may be advantageous; when the inflammation has become established, warm fomentations over the epigastrium and vaginal enemata as hot as can be borne, are serviceable. After the acute symptoms have passed, blisters should be applied over the seat of induration.

3. *Treatment of Abscess.*—If it becomes evident that suppuration is taking place, we should wait for pointing of the abscess if the condition of the patient will admit of delay. Though the pus usually discharges itself by mucous or cutaneous surfaces, in rare cases it bursts into the peritoneum, and then the result is usually fatal; hence we cannot always wait for spontaneous opening. Should the symptoms of the patient indicate marked purulent absorption, a hypodermatic exploring needle is plunged into the softened spot, care being taken to avoid large vessels, if possible; if pus be found, the needle of the aspirator is now passed in, the matter discharged, and the cavity washed out with carbolized water. Should the sac fill up again, a more free opening is indicated; this is done with bistoury or the galvano-cautery knife; a double drainage-tube is inserted, and the cavity washed out regularly until it closes.

If we have our choice of the seat of opening, the vagina, next the rectum, and lastly the external abdominal wall should be selected. If long sinuses exist, which show no tendency to heal, these should be scraped, dilated with tents, or incised; if the pyogenic membrane still secretes pus, it may be filled

with tincture of iodine or a strong solution of carbolic acid, and then these fluids removed. Fistulæ are to be treated by making direct exits, and by operative procedures, which are described elsewhere.

In cases of pelvic abscess, Mr. Lawson Tait advocates and practises opening by abdominal section, cleansing out the purulent mass, uniting the edges of the walls to the abdominal incision, and establishing drainage. In thirty cases of abdominal section for the cure of pelvic abscess, all cases recovered.

Pelvic Peritonitis.

Definition.—An inflammation affecting the pelvic peritoneum chiefly.

Synonyms.—Perimetritis, pelveo-peritonitis.

Occurrence.—Whilst pelvic cellulitis is seldom disconnected from puerperal causes, pelvic peritonitis occurs very frequently in the non-parous woman; it is of quite frequent occurrence.

Etiology.—Pelvic cellulitis; by contiguity.

Parturition and abortion; due to sepsis or to injuries.

Gonorrhœa; by passage of the virus along the tubes into the peritoneal cavity, or through sympathetic irritation.

Latent gonorrhœa in the male (Noeggerath); a gonorrhœa apparently cured infecting the vagina and thence extending to the tubes.

Endometritis, ovaritis, and salpingitis; by extension.

Pelvic tumors—uterine fibroids, ovarian tumors, carcinoma, and tuberculosis.

Imprudence during menstruation.

Excessive venery.

Uterine displacements, especially prolapse.

Traumatism; falls, blows, cutting operations, etc.

The use of instruments on the uterus; for examination or curative purposes, or for abortive purposes; tents, sounds, pessaries, and even caustics.

Escape of fluid into peritoneal cavity; from hæmatocele, puncture or rupture of ovarian cyst, extrauterine pregnancy, pelvic abscess, intrauterine injections, etc.

Pathology.—There are at first congestion and dryness of the peritoneum with desquamation of its epithelial layer, which gives it a dull sodden appearance.

In the next stage there is an exudation of serum, fibrin, and pus in varying proportions; it may be chiefly serous with only a little fibrin and a few pus cells, or principally fibrinous with a little serum, or sero-purulent, or fibrino-purulent in bad cases.

When serous, the fluid collects in Douglas's pouch; it may become encysted here by a fibrinous exudation; if the patient recovers, the serum is absorbed.

The fibrinous exudation gives rise to adhesions between the uterus and neighboring organs and walls of the pelvis; it fastens down the uterus and its appendages; these adhesions, if the patient recovers, remain for a very long time; they may become stretched and very thin, but it is doubtful whether they ever entirely disappear.

The pus may be entirely absorbed if in small quantity; if in large amount, it forms an abscess which is then subject to the same course as that occurring with cellulitis.

Pelvic peritonitis may extend and involve the general peritoneum.

Symptoms.—We may distinguish two forms, acute and chronic.

Acute Cases: Rigors—these may be absent or simply chilly sensations may mark the invasion.

Febrile movement, 102° to 104°, but may rise to 106° in bad cases.

Rapid pulse, at first full, afterward weak.

Anorexia.

Nausea and vomiting.

Constipation.

Tympanites.

Prostration.

Rapid emaciation.

Dorsal decubitus.

Lower extremities flexed.

Extreme tenderness over abdomen.

Pain in lower part of abdomen.

Difficulty in micturition.

Anxious and pinched countenance.

Mind clear, but may be slight delirium at night.

From this it will be seen that the symptoms resemble very closely those of acute general peritonitis; the pain is, however, rather less severe, the tympanites less marked, and the prostration not as great.

Chronic Cases: In these the invasion is very insidious. There is

Pain in pelvis; increased upon locomotion, vaginal examination, or coition.

Feeling of weight in pelvis.

Emaciation.

General depreciation of health.

Anorexia.

Slight febrile movement.

Disturbances of menstruation.

Disturbances of urination.

Disturbances of defecation.

Physical Signs.—Great sensitiveness will interfere with thorough examination.

During the first stage, nothing but a hot and œdematous feeling in the vagina will be recognized. Later, the pelvic roof will feel hard and resisting, and this feeling will be more or less diffuse; behind the uterus, less frequently to one side of it, we often feel a resisting mass due to the exudation.

The uterus is displaced, most often forward, and with its appendages is fixed; this displacement may be increased or altered later on by the contraction of the adhesions.

When an encysted serous exudation is present, this will generally be in Douglas's pouch, and give an indistinct sense of fluctuation.

Abscess will give the same signs as that occurring with cellulitis.

Differential Diagnosis.—It would most easily be confounded with:

Pelvic cellulitis.

Pelvic hæmatocele, or hæmatoma.

Uterine fibroids.

Fecal impaction.

Small intrapelvic ovarian cystoma.

Extra-uterine pregnancy.

The differentiation of these is accomplished by remembering the points given under cellulitis (*vide* p. 313).

Course and Results.—The case may terminate in recovery after several weeks; the adhesions remain, as do also the displacements of the uterus and its append-

ages; these adhesions may become stretched and loosened, but probably never disappear.

The disease may pass from the acute to the chronic form, or it may spread to the general peritoneum, and is then usually fatal.

If the patient recovers, serum is absorbed and also pus if in small quantity. If pus be present in large amount, it forms an abscess, and this follows the same course as in cellulitis.

Sterility may result from binding down or stricture of the Fallopian tube, atrophy or destruction of the ovary. The displaced uterus will also give rise to symptoms in time. There often remains a tendency to abortion, since the uterus cannot expand and rise as it should during pregnancy.

In some of the chronic cases there is a marked tendency to exacerbations upon the slightest cause, such as menstruation, etc.

Prognosis.—The prognosis as regards the immediate effect on life is good except in septic and gonorrhœal cases; it must be remembered that the disease may become general, and that abscess may form and influence the result.

The prognosis in regard to future comfort of the woman must be very guarded, considering the inevitable displacements of the uterus and the changes in its appendages, which tend to produce sterility, abortion, dysmenorrhœa, amenorrhœa, etc.

Treatment. *Acute Cases.*—Same as that of cellulitis, excepting that we must use larger doses of opium—sufficient to control the pain and keep the patient absolutely quiet. The weight of the bed-clothes should be kept from the abdomen by a supporting cradle. The bowels should be left undisturbed until after the

fever has subsided. The fever will often be high and need reduction by the abdominal ice-water coil or by placing the patient upon a Kibbee's cot.

Chronic Cases.—These are treated as are cases of cellulitis after the acute symptoms have passed. Convalescence is slow and treatment must be long-continued.

Abscess is treated just as though it resulted from cellulitis. The collections of sero-pus, if not absorbed, may be required to be evacuated in a similar manner to that employed with purulent ones, if they interfere with the health of the woman.

In convalescence from both pelvic cellulitis and peritonitis, the amount of exercise which should be allowed the patient is such that it will not tire her, nor cause any local annoyance or pain; more than this is hurtful. Sexual relations should also be forbidden during convalescence.

Pelvic Hæmatocele and Hæmatoma.

Definition. –A collection of blood in the pelvic cavity, usually into the peritoneum, sometimes behind it. In the former case it is called *pelvic hæmatocele;* in the latter, *pelvic hæmatoma.*

Synonyms.—Bloody tumor of the pelvis. Of *hæmatocele:* Retro-uterine hæmatocele, uterine hæmatocele. Of *pelvic hæmatoma:* Periuterine hæmatoma, thrombus.

Occurrence.—They are not common. Schröder estimates their frequency as 7 per 1000 gynecological cases.

Etiology. *Predisposing Causes.*—Period of sexual activity; the majority occur between twenty-five and thirty-five.

Menstrual period.
Multiparæ.
Chronic uterine, ovarian, or tubal disease.
Former pelvic peritonitis or cellulitis.
Varicosities of subperitoneal veins or of those of broad ligament.
Aneurismal dilatation of the pelvic arteries.
Plethora or anæmia.
Scurvy, purpura, and hæmophilia.
Phosphorus poisoning.
Exciting Causes.—Sudden checking of menstrual flow.
Profuse menstruation.
Violent exercise or coitus during menstruation.
Excessive coition.
Blows and falls.
Obstruction in tube, uterus, or cervix.
Violent efforts.

Varieties.—1. *Intraperitoneal*—most common—the effusion takes place into the pelvic peritoneum; it is then called *pelvic hæmatocele.*

2. *Extraperitoneal* or *subperitoneal*—uncommon—the effusion takes place beneath the pelvic peritoneum, in the areolar tissue of the pelvis, or between the layers of the broad ligament; it is then called *pelvic hæmatoma.*

Sources of the Hemorrhage.—1. Pelvic peritoneum and connective tissue; from the veins of the pampiniform plexus, or subperitoneal veins, or those in the connective tissue.

2. Pelvic arteries; seat of aneurism or otherwise diseased.

3. Uterus; rupture, regurgitation of menstrual blood, rupture of interstitial pregnancy.

4. Fallopian tube; rupture of tubal pregnancy, hyperæmia of the mucous membrane.

5. Ovaries; rupture of ovarian pregnancy, of Graafian follicles, or of bloodvessels.

Pathology.—In *hæmatocele* the blood collects in Douglas's pouch, or more rarely beneath the pelvic peritoneum. After a few days it coagulates, changes into a thick grumous or tarry mass, and finally into a hard nodular tumor consisting chiefly of fibrin. It is soon hemmed in by organization of an effusion resulting from the local peritonitis excited; in this way it is shut off from the general peritoneal cavity above. Sometimes the blood collects between the layers of a previously existing mass of adhesions caused by a former peritonitis.

When of the subperitoneal variety (*hæmatoma*), the blood readily makes a cavity in the loose areolar tissue.

As already stated, absorption usually takes place; instead of this, the blood may be discharged into the vagina, rectum, bladder, or, rarely, the peritoneum. Or, rarely, suppuration may take place in the mass, previous to or during its discharge.

Symptoms.—The symptoms of both forms are the same. There may be premonitory symptoms due to an exaggeration of those caused by preëxisting disorders, such as pain in the hypogastrium, metrorrhagia, etc.

The symptoms are usually ushered in suddenly by the loss of blood; but this may be gradual. The symptoms depend upon the rapidity and the amount of blood effused; they are due to the loss of blood, peritoneal shock, and consequent peritonitis; or, rarely, septicæmia, and the mechanical effects of the retrouterine tumor.

The symptoms due to abdominal shock and loss of blood are:

Pallor.
Faintness, or even syncope.
Prostration.
Nausea and vomiting.
Great thirst.
Dimness of vision.
Rapid and feeble pulse.
Sighing respiration.
Cold surface covered with perspiration.
Subnormal temperature.
Pain in pelvis.
Uterine tenesmus.
Metrorrhagia.

These symptoms are, in rare cases, so pronounced, that they terminate in collapse, and the patient dies; but, more commonly, reaction sets in within a day or two, and then we have these symptoms diminish in intensity, and there are added those of pelvic peritonitis.

The mechanical effects of the tumor behind the uterus, besides exciting inflammation, are interference with micturition and defecation, showing itself by frequent desire to micturate, painful micturition, sometimes retention of urine and constipation.

Physical Signs.—Apply to both forms: By abdominal palpation, vaginal touch, and combined manipulation, we discover a tumor of variable size lying behind the uterus, rarely in the folds of the broad ligament or in front of the uterus. If we examine immediately after the accident we do not feel any tumor, since the blood is still fluid; but if previous

peritonitic adhesions have existed through which the blood is hemmed in, the mass is made palpable.

In a day or two sufficient peritonitic exudation has taken place to encase the fluid; then we find a soft, smooth, and obscurely fluctuating mass; in a few days this is further changed into a firm, solid tumor. The uterus lies in front of this tumor, the cervix being pushed against the symphysis, and with the uterus is often elevated, so as to be out of reach of the finger. By rectal examination we find the tumor encroaching upon the space of the bowel.

Should suppuration of the mass take place, the physical signs become changed correspondingly.

DIFFERENTIAL DIAGNOSIS.—They require to be differentiated from each other and from:

Pelvic cellulitis and abscess.

Pelvic peritonitis, especially when a serous effusion has been enclosed in Douglas's pouch.

Retroflexion and retroversion of the uterus.

Fibroid on posterior wall of uterus.

Extrauterine pregnancy.

Ovarian cyst behind uterus.

The following tables (taken from the *American System of Gynecology*, Van de Warker) will serve to differentiate pelvic hæmatocele from pelvic hæmatoma:

HÆMATOCELE.	HÆMATOMA.
Tumor higher up, projecting at the sides and behind the uterus.	Tumor descending into recto-vaginal septum.
Uterus fixed in varying directions.	Uterus pushed upward and forward; more distinct from the abdominal tumor.
No discoloration of the vaginal cul-de-sac; frequent paleness of mucous membrane.	Violet color of the vaginal cul-de-sac.

Pelvic Cellulitis and Abscess.—There is no such sudden development, and usually no hemorrhage from the uterus. The tumor is usually at the side of the uterus, is very tender, is hard at first and softens afterward, and does not press the uterus forward nor lift it up.

Pelvic Peritonitis, especially when a Serous Effusion has been enclosed in Douglas's Pouch.—Here we have inflammatory symptoms from the first, the invasion is different, there is usually no hemorrhage from the uterus, no symptoms of profound anæmia, the mass is very tender, it does not harden rapidly; puncture with carbolized hypodermatic needle is justifiable if still in doubt.

Retroflexion and Retroversion of the Uterus.—There is no history of symptoms of profound anæmia: only one mass will be felt, and this consists of the uterus, while in hæmatocele we find the uterus as a small mass in front of a posterior one; no changes take place in the retroflexed or retroverted uterus; if non-pregnant, the sound will decide; examination by rectum and abdomen usually settles any doubt.

Fibroid on Posterior Wall of Uterus.—No sudden onset, growth gradual, painless, not tender, moves with uterus, does not fix the latter, and does not displace it as much, and is hard and nodular.

Extrauterine pregnancy is accompanied by history and mammary and other signs of pregnancy, including amenorrhœa, is of slow growth, and rarely gets behind the uterus.

Ovarian Cyst behind Uterus.—No history of sudden onset, not accompanied by inflammatory symptoms, nor those due to loss of blood, is painless, and increases in size instead of diminishing.

Course.—In most cases the patient recovers from

the shock and the symptoms due to loss of blood and the peritonitis, in a few weeks; the blood is absorbed in several weeks or months, and nothing but a small fibrous mass, which gives rise to no inconvenience, remains. When a great deal of blood has been lost, the patient may die from the effects of this—but this is rare.

The mass may be discharged by vagina, rectum, bladder, or, rarely, peritoneum (in the last case it excites fatal peritonitis). Should the mass suppurate through artificial opening or spontaneously, septicæmia often ensues, and is then usually fatal.

Prognosis.—Depends upon the amount of blood lost, and the intensity of the subsequent peritonitis. Usually it is favorable.

Treatment.—Same in each form. 1. *At the Time of Hemorrhage.*—Absolute quiet on back, head lowered if great anæmia exists, ergot by mouth or hypodermatically (℥j fluid extract every ten minutes—four doses), ice-bags to abdomen, stimulants to prevent heart-failure, and warmth to the extremities.

If collapse is threatened, increase stimulants and give hypodermatic injections of gr. $\frac{1}{40}$ digitalin and ℥j whiskey, or brandy ℥ij and ether ℥ss.

2. *After reaction sets in*, treat the case as you would one of idiopathic pelvic peritonitis.

3. *Locally.*—Do not interfere with the effused blood; in most cases it becomes absorbed; whilst, if you incise, you increase the risk from hemorrhage and from septicæmia. If, however, the mass has begun to suppurate, and the patient is beginning to show signs of septic derangement, it should be opened and treated like pelvic abscess.

CHAPTER XIII.

DISORDERS OF MENSTRUATION—CHLOROSIS.

Physiology of menstruation—Amenorrhœa—Menorrhagia and metrorrhagia—Dysmenorrhœa—Chlorosis.

These include:

Amenorrhœa.

Menorrhagia.

Dysmenorrhœa.

These are, properly speaking, merely symptoms of pathological conditions, which are in most cases definitely known, and have been considered in various parts of this book. But it is very convenient to treat separately of these abnormalities of menstruation.

Physiology of Menstruation.—Menstruation consists of a periodical bloody discharge from the external genitals in the female. This usually occurs about every twenty-eight days, and is dependent on ovulation. At each period a Graafian follicle reaches maturity, and approaches the surface of the ovary, causing a protuberance; this is accompanied by marked congestion of the ovaries, tube, and uterine mucous membrane. The Graafian follicle and the overlying ovarian stroma burst, and the contents of the former, with some of the membrana granulosa attached, escape, are grasped by the Fallopian tube and conveyed to the uterus. The emptied ovisac fills up with blood, and undergoes changes which convert it into the corpus luteum.

Whilst ovulation is going on, or before, or directly

after—this has not been exactly determined—the engorged mucous membrane of the uterus sheds its superficial layer in fragmentary débris; this, together with a certain amount of blood derived from its ruptured vessels, and mucus, constitute the menstrual discharge.

It is difficult to give a standard menstrual flow, for it varies so much, even in health. In general terms, it is one which does not produce any deleterious effects upon the general health, and is accompanied only by a very slight pain in the back, a feeling of fulness in the pelvis, and a slight general malaise, and in which about four or five ounces of blood are lost; it lasts on the average five days—on the first day there is a mucous or mucopurulent discharge, on the second a little blood is added, on the third and fourth it is largely bloody, and on the fifth again becomes mucous or mucopurulent. But it may last longer than five days, or more than five ounces of blood may be lost, and yet be perfectly normal.

Menstruation continues between puberty (about fifteen) and menopause (about forty-five), excepting during pregnancy, and generally ceases during lactation; exceptionally, menstruation may extend far beyond the limits in years just given.

Amenorrhœa.

Definition.—Absence of menstruation in a woman in whom it should naturally be present. This does not include cases of atresia; for here there is menstruation, but the discharge cannot escape.

Occurrence.—It is met with frequently, more especially in the higher classes.

Varieties.—1. Primary or congenital amenorrhœa,

or emansio-mensium, where the discharge has never appeared.

2. Secondary or acquired amenorrhœa, or suppressio-mensium, in cases in which it has previously regularly appeared.

Etiology. 1. *Primary: a.* Local.—Absence of uterus or ovaries.

Rudimentary uterus or ovaries.

b. Constitutional.—Chlorosis.

Plethora.

Tuberculosis.

2 *Secondary: a.* Local.—Atrophy of the uterus.

Superinvolution of the uterus.

Atrophy of both ovaries.

Disease of both ovaries (especially cystic).

Pelvic peritonitis and cellulitis.

Exposure to wet and cold during menstruation.

b. Constitutional.—Chlorosis.

Plethora.

Tuberculosis.

Obesity.

Chronic diseases of liver and kidney (occasionally).

Acute diseases, especially fevers.

General debility from indolence and luxury, unhealthy occupations, want of exercise and fresh air, and bad sanitary conditions.

Change of mode of life.

Change of climate (seen in emigrants).

Mental emotion.

Pathology.—Is indicated by a perusal of the causes.

Menstruation is absent during pregnancy, before puberty, after the menopause, and in most cases during lactation; but it is not uncommon to find a woman

nursing her child and yet menstruating, even a few months after delivery.

Under certain circumstances the onset is retarded; it may not appear until the sixteenth or seventeenth year or even later. The menopause may occur very early—even as early as twenty-five, though this is rare.

Amenorrhœa must be differentiated from atresia by physical examination.

In rare cases, menstruation may be vicarious, and take place from the nose, gums, stomach, lungs, ulcers, hemorrhoids, intestines, or into the retina, or beneath the skin.

Course and Prognosis.—Depend upon the cause and upon whether the condition be primary or secondary. If the cause be one which can be removed, the prognosis is good, for menstruation will then reappear.

Treatment.—Consists in discovering and removing the cause. Whilst this is being done, we can with advantage make use of local stimulating treatment to hasten the result.

Constitutional Treatment.—The treatment of most of the constitutional causes has already been given or will be detailed under chlorosis (*vide* p. 352); or else it belongs to medical works.

Plethora is treated by abstraction of blood from time to time, non-stimulating and light diet, avoidance of alcoholics, use of considerable exercise, and catharsis by salines two or three times a week.

Local Treatment.—When the uterus is absent we can do nothing except to abstract a small amount of blood at each epoch, should there be any distressing symptoms. In other cases the local treatment may consist of:

Emmenagogues.

Enemata.
Baths.
Cupping.
Tents.
Sounds.
Intra-uterine stem pessaries.
Electricity.

Emmenagogues are very often of no service; but still in some cases they cause local congestion and stimulation, and are decided aids. The best is potassium permanganate in doses of one or two grains three times a day. Dr. Fordyce Barker, who was the first to bring this drug prominently before the profession, reports most excellent results from its use, and these reports are corroborated by others. It is best given in pill form, but owing to its irritating effects upon the stomach, the patient should be instructed to drink at least a tumblerful of water immediately after taking the pill. Binoxide of manganese and apiol have also proven beneficial in some cases.

The less useful emmenagogues are iron and aloes, myrrh, tansy, ergot, rue, and savine. The use of emmenagogues is not unattended with danger of producing inflammation.

Vaginal enemata of hot water, plain or medicated with aloes or salt, are useful.

Baths, as hot as the patient can bear them—foot-baths with mustard, or hip-baths—may prove valuable.

Cupping the cervix by a syringe, consisting of a cylinder of hard rubber, from which the air is exhausted by the piston, is of service.

Tents may, by irritation produced, be followed by success.

The sound, passed daily for weeks, is often followed by good results.

Intra-uterine stem pessaries supply continuous stimulation and irritation, and are of great value. The best are those in which the stem is composed of two metals —copper and zinc—whereby a feeble electric current is excited. They are held in place by abdominal bands.

Electricity may also be applied by using the battery; one pole is applied over the lower part of the spine and the other introduced into the uterus.

Local treatment should be persevered in for some time in all cases; it may take even a year before the desired effects are accomplished.

Menorrhagia and Metrorrhagia.

Definition.—*Menorrhagia* is too great a loss of blood at the menstrual period; since the normal quantity of blood lost at each period is subject to great variations, the profuse discharge must give rise to deleterious effects in order to constitute menorrhagia; this symptom is popularly known as "flooding."

Metrorrhagia is any loss of blood from the uterus occurring during the intervals of menstruation. It is considered in connection with menorrhagia for convenience' sake, and because almost everything which is said of the latter applies to the former; it is not, however, a disorder of menstruation.

Occurrence.—They are of very frequent occurrence. They are merely symptoms of very common pathological conditions.

Etiology. 1. *Constitutional Causes.*—Anæmia and chlorosis.

General debility.

Plethora.
Diseases of the heart.
Diseases of the liver.
Diseases of the kidney.
Hæmophilia.
Scurvy.
Menopause.
2. *Local Causes.*—Subinvolution of the uterus.
Chronic metritis.
Uterine fibroids.
Uterine polypi.
Uterine fungosities.
Sarcoma of the uterus.
Carcinoma of the uterus.
Larceration of the cervix.
Endometritis.
Granular degeneration of the cervix.
Uterine displacements.
Retained products of conception.
Chronic ovaritis.
Fecal impaction.
Results.—If unchecked may result in :
Anæmia.
Chlorosis.
General depreciation of health.
Gradual exhaustion.
Death.

Diagnosis of the cause of the profuse loss of blood is essential. Every method of physical examination is to be resorted to, if necessary, and the constitutional as well as the local causes inquired into and determined. It may be necessary to dilate the cervix with tents, and to examine the interior of the uterus digitally.

Prognosis.—Depends upon the cause; usually it is favorable; if the cause be removable, the chances of cure are good.

Treatment.—Is curative and palliative.

1. *Curative Treatment.*—This consists of the removal of the cause, after this has been determined; the details of treatment of these various conditions have been given in different parts of this volume, or are to be found in treatises upon the practice of medicine.

Exceptionally, the menorrhagia or metrorrhagia is salutary—in certain cases of diseases of the heart, liver, or kidneys.

2. *Palliative Treatment.*—This is to be employed to check the flow until cure can be established.

The woman is to be kept quiet in bed, opium used to insure this; iced cloths applied to lower part of the abdomen, the bowels moved by an enema, food to be ice-cold; and iced lemonade, or ice water, to which thirty drops of aromatic sulphuric acid have been added, is to be given; the foot of the bed is to be raised somewhat.

As hæmostatics, the most valuable are:

1. Extr. ergot. fl. ℥ss ad ℥j; by mouth, rectum, or hypodermically.

2. Ergotin or extr. ergotæ, gr. v ad x; in pill or by rectal suppositories.

3. Acid. gallici, gr. v ad xx.

4. Tinct. cannab. ind., ♏ xx ad xl.

5. Extr. cannab. ind., gr. ½.

6. Extr. cannab. ind. fluid., ♏ j.

7. A very useful pill is:

℞.—Ergotin. . . . . gr. ss.
Quininæ sulphat. . . . . gr. ij.
Extr. nucis vom. . . . . gr. ½.—M.
S.—One pill t. i. d.

These should be administered in the doses given, every two or three hours, until the desired effect is produced.

If the hemorrhage still continues, vaginal tampons should be employed; if the simple ones are unsuccessful, others soaked in alum, tannin, or iron subsulphate (diluted 1 to 3) are applied to the cervix and then the vagina retamponed.

Should all these means fail, nothing is left to us but to dilate the cervix and swab out the interior of the uterus with a dilute solution of iron subsulphate, alum, or iodine; or we may inject these solutions gently. This procedure is not free from danger, but it is proper as a last resort.

Dysmenorrhœa.

Definition.—Excessively painful menstruation.

Occurrence.—Very frequent.

Etiology.—It is due to some abnormal state of the uterus, its appendages or surroundings, or to the general condition of the woman; but there are many cases which occur without assignable cause.

Varieties.—It is customary to speak of the following:

Neuralgic dysmenorrhœa.

Congestive dysmenorrhœa.

Obstructive dysmenorrhœa.

Membranous dysmenorrhœa.

Ovarian dysmenorrhœa.

Very often we cannot differentiate between these varieties; there may be a combination of two or more forms.

Neuralgic Dysmenorrhœa.

Definition.—In this form we can discover no structural cause for the pain; it is apparently due to a peculiar nerve-state accompanying neuralgia in general, the irritation being supplied by the local congestion attending menstruation.

Synonyms.—Sympathetic dysmenorrhœa, spasmodic dysmenorrhœa (the latter is of doubtful correctness).

Occurrence.—Very frequent.

Etiology.—That of neuralgia elsewhere:

Anæmia.
Chlorosis.
Malaria.
Gout and rheumatism.
Lead poisoning.
Enervating habits.
Masturbation and excessive venery.
Debilitating diseases.
Unhealthy occupations.
Sedentary occupations.
Excessive mental application.

All these causes tend to produce the so-called "neuralgic diathesis."

Symptoms.—The pain accompanying this form of dysmenorrhœa is of a neuralgic character; either a sharp and fixed, or a lancinating or colicky pain, usually referred to the pelvis; sometimes it radiates from here down one thigh or up into one shoulder; it may be referred to the entire abdomen, or, rarely, to an entirely different part of the body.

It usually shows itself some hours before the flow commences; it may disappear when the menses come

on, or continue, usually less severe, throughout the period.

It is always an annoying pain; sometimes it is excruciating, and may render the patient almost maniacal for the time.

During the intermenstrual period, the woman often has neuralgias elsewhere.

Differential Diagnosis from other forms of Dysmenorrhœa.—*In Congestive or Inflammatory*, there are constitutional disturbances, signs of uterine or perituterine disease, which persist in the intermenstrual period, and the dysmenorrhœa does not usually occur with every period.

In Obstructive Dysmenorrhœa, the pain is expulsive in character; it increases until a quantity of blood escapes, and then it stops, but soon increases again until the contents of the uterus are expelled; the discharge consists of clots; on examination we find an obstruction.

In Membranous Dysmenorrhœa, there is increasing expulsive pain until the membranous cast is expelled.

In Ovarian Dysmenorrhœa, pain usually comes on a few days before the discharge; it usually ceases when the discharge appears; the ovary is often swollen and tender; the pain is over one or other ovary; there are often mammary irritation, vomiting, and hysteria.

Course.—If the etiological factor be not removed, it has a tendency to become worse, and often leads to the other forms of dysmenorrhœa.

Prognosis.—Is good, if the patient be able to adopt medical measures to insure a cure, such as entire change of mode of life in some cases; if this cannot be done the prognosis is unfavorable as regards cure, but amelioration of the pain can usually be obtained. Parturition effects a cure in most cases.

Treatment.—Ascertain the predisposing cause and treat this.

If chlorosis exists, this should be treated as given elsewhere; if malaria, this should receive proper attention, etc.

In the intermenstrual periods, local treatment of the uterus by sounds, tents, intrauterine stem galvanic pessaries, and electricity, as used in amenorrhœa, may be beneficial.

For the pain there are certain remedies which will remove it entirely or partially; the best of these anodynes are tinct. cannab. ind., ♏ xx; chloral, gr. xv; potass. brom., gr. xxx; chlorodyne, ♏ xxx; suppositories of extr. opii, gr. ss., and extr. bellad., gr. ss, or extr. hyoscyam., gr. j; or apiol, ♏ v; or hot water enemata, containing tinct. asafœtidæ, or a hot hip or general bath.

These remedies are to be repeated two or three times a day, p. r. n. Beware of giving opium by the mouth or subcutaneously, since this may be the starting-point of the opium habit.

Congestive and Inflammatory Dysmenorrhœa.

Definition.—This form is accompanied by, and has for its apparent cause, some abnormal condition of the uterus, its appendages or pelvic surroundings; these parts, owing to their abnormal state, become excessively congested, and in some cases inflamed, during the catamenia; this gives rise to pain.

Occurrence.—Quite common. It usually occurs in women who have menstruated before, but it may be primary.

Etiology.—The most frequent causes are:

Plethora.

Exposure to wet and cold at menstrual period.

Displacements of uterus.

Uterine fibroids.

Chronic metritis.

Endometritis.

Pelvic peritonitis and cellulitis.

Salpingitis.

Symptoms.—At the menstrual period the patient is seized with a severe pain in the pelvis; this lasts throughout the epoch, though sometimes becoming gradually less.

With this pain, there is a variable amount of constitutional disturbance—fever, rapid and full pulse, headache, anorexia, nausea, constipation, and nervous irritability.

Differentiation from other forms of Dysmenorrhœa.—This will usually be easy. The presence of constitutional disturbance, the non-expulsive character of the pain, the absence of neuralgias elsewhere in the intermenstrual period, the absence of obstruction and of ovarian tenderness, and the diagnosis of some abnormal condition of the uterus, appendages, or surroundings, will distinguish it.

Prognosis.—Depends upon whether the condition causing it is remediable. If the pathological condition is one amenable to treatment, the prognosis is favorable.

Treatment.—Consists in removing the causes; the methods of accomplishing this have been described in different parts of this work.

If due to plethora—depletion by leeches or lancet,

cathartics, active exercise, and non-stimulating diet are indicated.

When due to exposure to wet and cold—rest, warm baths, and diaphoretics are serviceable.

In all cases, rest during the flow is necessary; the treatment of the pain is identical wtth that described in the neuralgic variety.

Obstructive Dysmenorrhœa.

Definition.—A form of dysmenorrhœa due to some mechanical impediment to the free escape of the flow. This obstruction may exist in the cervix or in the vagina. Some cases are thought to be due to an altered condition of the menstrual discharge—this becomes clotted and contains fragments which will not pass through the os internum or externum.

Synonym.—It is also known as mechanical dysmenorrhœa.

Etiology.—The most frequent causes of such obstruction are:

- Contraction of the cervical canal, or of its external or its internal os; congenital, or acquired by the use of caustics, result of labor, etc.
- Displacements of the uterus.
- Small polypus in uterus acting as ball-valve.
- Uterine fibroids affecting cervix.
- Stricture of vagina.
- Minute opening in hymen.

Symptoms.—After sufficient blood has accumulated in the uterus to distend it, this organ is stimulated to contraction, and endeavors to dispel the blood; this gives rise to a paroxysm of severe uterine tenesmus, which lasts until the contents of the uterus are ex-

pelled, usually in the form of clots. Relief is then obtained; but as the flow again accumulates, the same process is repeated. The pain is situated in the pelvis, and is of a colicky, expulsive character.

Differential Diagnosis from other forms of Dysmenorrhœa.—This is easy. The diagnosis is made positive by the discovery of the point of obstruction by physical examination.

Sometimes we find that, although the case evidently belongs to the obstructive variety, we can readily pass a probe into the uterus. These cases are explained by supposing the existence of some spasm at the time of menstruation; or possibly by the fact that the menstrual discharge is so abnormally clotted, that it will not pass through an opening sufficiently large to admit a probe.

In the congenital cases of cervical constriction, the external os is usually contracted, giving rise to the pinhole os, and the cervix is often elongated.

Prognosis.—As in the other forms, depends upon the prospects of curing the condition which is the cause of the symptom.

Treatment.—Consists in endeavoring to remove the condition causing the obstruction.

If a displacement of the uterus exists, the appropriate treatment should be instituted; even a very slight displacement may be the cause of the trouble.

Vaginal stricture is to be treated by dilatation or division; if the hymen is at fault it is to be incised; polypi are to be removed; fibroids, also, when possible.

Treatment of Constriction of the Cervix.—This may be effected by dilatation and by incision. Such a constriction may be due to an anteflexion, and is then opposite the internal os, or it may be congenital, or

due to the application of caustics or the effects of parturition, when it will be usually found at the external os; it may involve the entire canal.

Dilatation can be practised:

1. By graduated metallic sounds; these are introduced and kept in a few minutes, and then a larger size used, until the canal is pervious to the desired extent; this is done at one or at several sittings; it is best to anæsthetize the woman during their use.

2. Sea-tangle or tupelo tents may be used to dilate the cervix to the required degree.

3. Dilating instruments, the diameter of which can be increased after introduction and the canal thus dilated gradually, can be used.

4. Divulsors may be used with or without previous dilatation by tents; they are introduced, and the canal forcibly expanded; good results have been obtained.

In all these methods of practising dilatation, antiseptic precautions should be used; after the desired size of the cervical canal has been obtained, it should be kept from recontracting by introducing a glass plug for some time.

Incision.—1. Simpson's operation consists in the use of the hysterotome; the woman being in Sims's position, and the speculum introduced, this instrument is passed up to the internal os closed, the canal having been dilated previously with tents, if necessary; after it is in position, pressure upon the handle causes the extrusion of the blade, the instrument being withdrawn with the blade exposed, and the latter pushed out more as the instrument is drawn out, an incision results which is wider below than above; the other side is treated in the same way.

2. Double hysterotomy; by instruments similar to

that of Simpson's, but with two blades, so that both sides can be incised at the same time.

3. Sims's operation: The woman being placed in Sims's position and the speculum introduced, the cervix is cut on each side by scissors; the inner blade reaches up to the internal os, the outer to the cervico-vaginal junction; the knife is then used to deepen the upper part of the incision at the internal os; hemorrhage is checked by pressure, the wound kept open by a strip of lint soaked in solution of perchloride of iron, and the vagina tamponed. The woman is kept quiet in bed for a week. In three or four days the lint is removed from the cervix, and the canal is kept pervious by the daily introduction of the sound, or the use of the intra-uterine glass stem. Antiseptic precautions are essential during the operation.

4. Thomas's modification of Sims's operation. The woman being placed as before, the vagina is syringed out with 1 to 30 carbolized water, and filled with the same solution, so that the cervix is bathed in it throughout the operation. The cervix being drawn down and steadied, a long slender bistoury is used to make an incision from a little above the internal os downward and outward through the cervix and external os, so as to cut entirely through the latter. The other side is treated in the same way and hemorrhage checked; a glass plug one and a half inches long is then inserted, the upper end passing through the internal os; it is retained by a vaginal tampon, the upper end of which is rendered astringent; this tampon is replaced in thirty-six hours by a pessary. The vagina is irrigated night and morning with carbolized water, and the patient kept in bed for two weeks; the glass stem should be worn for two months to prevent recontraction.

Very good results often follow these various methods of division.

Membranous Dysmenorrhœa.

Definition.—The expulsion of the lining membrane of the uterus in one piece or in shreds, at the menstrual period.

Synonym.—Decidua menstrualis.

Occurrence.—It is not of frequent occurrence.

Etiology.—This is not exactly settled; many views have been advanced. It has been attributed to metritis, to endometritis, to exaggerated congestion and irritation, to endometritic exudation, an exaggerated condition of the normal physiological effects, etc. Though a diseased condition of the uterus may be present in some cases, it is certainly not found in all; we have not yet discovered the real cause of this condition.

Pathology.—The expelled mass consists of the lining membrane of the uterus; it may be in one piece and then presents three openings—one for the cervical and two for the tubal openings; or it may be divided into a variable number of shreds. It may be turned inside out. When consisting of one piece, it is of triangular form, the internal surface soft and mucous, the external rough and shaggy; it presents numerous perforations—the openings of the utricular glands.

The exact cause of the separation is unknown; some believe it to be due to fatty degeneration between the mucous membrane and the underlying muscular tissue. Oldham's view is that at some time between the periods it is separated and ready for extrusion at the time of menstruation, the casting-off being due to an irritant influence transmitted to the uterus from the congested ovaries.

On microscopical examination the extruded coat reveals the ordinary structure of the endometrium, somewhat hypertrophied in all its elements, just as in the early months of pregnancy.

Symptoms.—As soon as menstruation begins there are pains of an expulsive character, like those of abortion; they are due to the same cause—the contraction of the uterus in its desire to get rid of the foreign body. These pains increase in severity and cause the cervix to dilate sufficiently for the mass to pass. The extrusion usually takes place at the second or third day, and then there is relief from pain.

Menorrhagia and metrorrhagia commonly follow this occurrence; endometritis also, is commonly established afterward.

The process may not be repeated; or it may occur again at the next or second epoch, or at longer intervals.

Differential Diagnosis.—It is easily distinguished from other varieties of dysmenorrhœa.

It might, however, be confounded with:

Early abortion.

False moles; blood or fibrinous casts of the uterus.

True moles.

Exfoliation of the vaginal mucous membrane.

Diphtheritic endometritis.

From early abortion, it is distinguished by the absence of all signs and symptoms of pregnancy, by its often being repeated at regular intervals, and by the absence of chorionic villi; the history of the case is often of more value than the examination of the cast, since a dysmenorrhœal cast may be difficult to distinguish from that due to an early abortion. Of the other conditions, these same remarks apply to true

moles; the other affections are readily differentiated by the aid of the microscope.

Prognosis.—As to life, is good; as to cure, unfavorable. Sterility is the usual but not the invariable result; parturition may effect a cure.

Treatment.—Quiet the pain by methods already given; it may be so severe as to require an anæsthetic.

During the intermenstrual period, if we discover any pathological condition, we endeavor to remove it.

The application of iodine, carbolic and nitric acids, iron, silver, and iodoform to the cavity of the uterus, is recommended in cases in which we can discover no cause to treat.

Ovarian Dysmenorrhœa.

Definition.—A form of dysmenorrhœa in which the ovaries are found the seat of chronic inflammation or other pathological change, and in which we can find no other cause for this symptom.

Pathology.—This is not really dysmenorrhœa, for the pain has no connection with menstruation, but is associated with ovulation.

The congestion of the ovary, the ripening of the Graafian follicle, and the extrusion of the ovum, in an organ which is not in a normal condition, give rise to pain.

Symptoms.—Several days before the appearance of the flow, the patient suffers from pain of a dull character referred to the pelvis or iliac fossa, most frequently the left, and radiating down the thighs. This pain diminishes as the flow becomes established. It is often accompanied by sympathetic mammary pain and tenderness, by nausea or even vomiting, and by hysterical phenomena.

The ovaries may be found enlarged, tender, and may be prolapsed.

Prognosis.—Is unfavorable. The affection is a very obstinate one.

Treatment.—The pain should be quieted in the manner already referred to. The general health is to be put into the very best general condition.

As a last resort, Battey's operation is justifiable; it has been followed by favorable results and not infrequently by cure.

Chlorosis.

Definition.—A disease, the exact nature of which is unknown, occurring in young women, characterized by an altered condition of the blood, and having anæmia for its most prominent symptom.

Synonyms.—Chloro-anæmia; green sickness. It is sometimes called anæmia, spanæmia, hydræmia, and oligæmia; but these belong properly not to the disease, but to its most prominent symptom.

Occurrence and Etiology.—It is of very frequent occurrence in young females at or about puberty.

The *predisposing* cause is puberty with its demands upon the strength of the female for the purpose of perfecting her sexual system.

The most common *exciting causes* are:

Enervating habits among the rich.

Unhealthy occupations.

Sedentary occupations.

Improper hygiene.

Want of sunlight.

Overcrowding.

Habitual mental or physical overfatigue.

Loss of sleep.

Anxiety.
Prolonged grief or fear.
Disappointment in love or otherwise.
Masturbation.
Constitutional diseases of an enfeebling nature, etc.

Pathology.—There are always found changes in the blood which are often identical with those occurring in anæmia. The number of red blood-globules may be normal or diminished; their composition is often altered, and there are usually present a considerable number of smaller or larger size than normal. In a few cases, congenital smallness of the aorta and other parts of the vascular system is found; these may have peculiarly thin walls.

It is usually classified as a blood disease; some suppose it to be a functional derangement of the sympathetic system.

Symptoms.—Onset insidious.
Pallor of skin and mucous membrane (exceptionally the color remains good).
Moderate emaciation.
Dyspnœa on exertion.
Palpitation and irritability of the heart.
Anæmic systolic murmur at base of heart.
Venous hum over jugular veins.
Tendency to attacks of syncope.
Loss of muscular strength.
Cough.
Loss of appetite.
Perverted appetite.
Nausea and vomiting.
Pain over region of the stomach.
Tenderness along spine.
Constipation; occasionally diarrhœa.

Amenorrhœa.
Menorrhagia (occasionally).
Neuralgias in various parts of the body, especially face and head.
Curious sensations in various parts of the body.
Nervous irritability.
Melancholia.
Dropsy.

The cases differ very much in their severity; only a few, or all of these symptoms may be present.

Differential Diagnosis.—From simple anæmia, pernicious anæmia, functional and organic disease of the heart, phthisis, and ulcer of the stomach.

Course and Prognosis.—Course is often lengthy. Prognosis depends upon the possibility of removing the exciting cause, upon the social condition of the patient, and the thoroughness of treatment; when these conditions are favorable, the prognosis is good.

Treatment.—Remove the cause, if possible.

Place the patient in the very best hygienic surroundings. Complete change of air and scenery, pleasant company, exercise in the open air, a sea-voyage, and sea bathing are very useful. General massage and electricity are of service.

Iron in some form; generally the subcarbonate, Blaud's pills, reduced iron, dialyzed iron, liq. ferri albuminat., or the sulphate, are best borne.

Inhalations of oxygen for ten to fifteen minutes twice daily should be combined with the administration of the chalybeate.

All preparations of iron produce digestive disturbances in some persons; if this be the case, oxygen inhalations should be used alone until the iron can be borne. Dr. McLane advises the administration of the

carbonate precipitated in mixture just before taking, as one of the most efficacious and least irritating methods of giving the drug.

Other tonics, such as nux vomica, mineral acids, gentian, phosphorus, and arsenic are often combined with iron to advantage.

CHAPTER XIV.

DISTURBANCES OF THE REPRODUCTIVE FUNCTION.

Of these we will consider sterility and extra-uterine pregnancy.

Sterility.

Definition.—An interference with the capability for conception.

Synonyms.—Barrenness. Infecundity.

Occurrence.—Its frequency, according to A. R. Simpson, is 1 to 8 or $8\frac{1}{2}$ marriages in the community; among members of the peerage, 1 in 6.11.

Kehrer estimates that in one-fourth the cases the husband is at fault; this may be an exaggeration, but the male is certainly very often the faulty party.

Physiology of Conception.—Our knowledge of this function is limited.

The seminal fluid of the male is ejaculated at the time of the orgasm during connection; some of the spermatozoa passing through the uterus into the Fallopian tubes meet with the ovule here, or passing through the tube to the ovary meet and impregnate the ovule at the surface of the latter organ; exactly where the ovule meets the spermatozoa we do not know. After being impregnated, the ovum travels through the Fallopian tubes into the uterus and fixes itself to its mucous membrane which has been previously prepared by vascularity and softness, so as to serve as a nidus.

Etiology.—By remembering these facts, it will be seen that (supposing no fault to lie with the male) to have impregnation, five conditions are essential:

1. It must be possible for the seminal fluid to enter the uterus and the Fallopian tube.

2. It must be possible for the ovum to pass to the uterus.

3. The ovule must be healthy.

4. The vitality of the ovum must not be interfered with.

5. The mucous membrane of the uterus must be in a condition favorable for the reception and fixation of the ovum.

The special causes may be subdivided into mechanical, inflammatory, and constitutional.

1. *Mechanical Causes.—a. Preventing entrance of semen into uterus:*

Vaginismus.
Absence or rudimental development of the vagina.
Absence or rudimental development of the uterus.
Malformations of vulva and vagina.
Imperforate hymen.
Atresia of vagina.
Atresia of the cervix.
Elongated cervix.
Valvular external os.
Cervical endometritis (through existence of the mucous plug).
Uterine polypi.
Tumors of the uterus.
Uterine displacements.

b. Preventing the passage of the semen to the ovary, or the ovum to the uterus:

Stricture of Fallopian tubes.

Displacement of Fallopian tubes or ovary.
Absence of Fallopian tubes.
c. Preventing the production of ovules:
Absence or rudimentary condition of ovaries.
2. *Inflammatory Causes.—a. Preventing the fixation of the impregnated ovum:*
Corporeal endometritis.
Membranous dysmenorrhœa.
Menorrhagia (more properly the conditions which produce it).
Metrorrhagia (more properly the conditions which produce it).
Uterine fungosities.
Chronic metritis.
Subinvolution of the uterus.
b. Causing abnormal secretions of the generative passages:
Vaginitis.
Cervical endometritis.
Corporeal endometritis.
c. Preventing the production of healthy ovules:
Chronic ovaritis.
Cystic disease of the ovaries.
Cellulitis and peritonitis, by binding down and compressing ovaries.
3. *Constitutional Causes.*—Usually only predisposing.
General debility.
Excessive anæmia.
Indolent and luxurious habits.
Obesity.

Prognosis.—Depends upon whether or not the cause is removable, and hence differs in each case.

Treatment.—First ascertain the cause by thorough examination. Eliminate the chance of the trouble being impotence or sterility in the male.

Having discovered the cause, treat it as you would under other circumstances, the description of which will be found under the respective titles in various parts of the books.

In obstinate cases, if the desire for offspring is very great and both parties are willing, the deposit of recently ejaculated semen into the uterine cavity by a long-nozzled syringe may be resorted to. The semen is drawn from the vagina or from a condom immediately after copulation. There must, of course, be an absence of causes of sterility above the cervix. Only a few drops of the semen are deposited; the time selected is just after the act and after the cessation of a menstrual period. This method exposes the woman to the dangers of intra-uterine injections, is only successful in a minority of cases, and is open to strong moral objections; hence it is rarely employed.

Extra-uterine Pregnancy.

Definition.—The arrest and development of the impregnated ovule outside the cavity of the uterus.

Synonyms.—Extra-uterine gestation. Ectopic gestation. Extra-uterine fœtation.

Varieties.—1. Tubal; the most common; the ovum develops within the tube proper.

2. Interstitial; when the ovum is developed in that part of the tube which passes through the uterine wall.

3. Tuboövarian; when it develops at the fimbriated extremity of the tube.

4. Abdominal; when it attaches itself to some part of the abdominal wall or its viscera.

a. Primary; where the ovum falls into the peritoneal cavity immediately after impregnation.

b. Secondary; where it drops into the abdomen from the Fallopian tube.

5. Ovarian; when the ovum grows in the ovary; existence of this form is denied by many.

6. Hernial; an excessively rare occurrence; when an impregnated ovum falls into and continues to develop in a hernial sac.

Occurrence.—It is quite rare; Bandl reports one case to 12,000 pregnancies. It is more common on the left than on the right side. It occurs more frequently in middle-aged than in young women, and is especially common in those who conceive after having been sterile many years.

Etiology.—It may be due to any condition which impedes the passage of the ovum to the uterus but which does not prevent the passage of spermatozoa to the ovary. As examples of such conditions may be mentioned:

Stricture of the Fallopian tube, due to
- Inflammation.
- Inspissated mucus.
- Small polypoid or other growths.
- Adhesions and contractions of inflammatory products of peritonitis and cellulitis.
- Pressure from abdominal tumors.
- Displacement of Fallopian tube.

Pathology.—The impregnated ovum having attached itself to its abnormal site, the latter undergoes alterations in an attempt to take the place of the uterus. If it attaches to some part of the tube, the mucous membrane hypertrophies and a decidua is formed; if upon the peritoneum, this becomes vascularized, and softened for the ovum.

In the case of tubal pregnancies, since the muscular

coat is thin, and although hypertrophying somewhat, it cannot resist increased distention, rupture usually results at the end of one, two, or three months; rarely this is postponed until later; in one case pregnancy went on to term. After rupture has taken place death may ensue from shock and collapse, or peritonitis may result, which may terminate fatally or in recovery; in the latter case, encapsulation of the fœtus and its envelopes occurs, and it then undergoes fatty, putrid, or lithopædic degeneration, and remains thus, or is discharged by fistulous passages through rectum, bladder, vagina, or abdominal walls.

In the interstitial variety, there being a greater proportion of muscular tissue, the case not infrequently goes on to term, and very often no rupture takes place.

In the abdominal, tuboövarian, and ovarian forms, there is sufficient room for expansion, and the case often goes on to term, rupture not taking place; the fœtus then usually dies, since it cannot escape, and liquefies and putrefies, or is converted into adipocere or a lithopædic mass, which may remain in the abdominal cavity, or be discharged by fistulous openings.

In all these forms the uterus undergoes changes similar to those accompanying normal pregnancy, but less in degree; it develops a decidua; these changes are the more marked, the nearer to the uterus the implantation is.

Symptoms.—1. *Symptoms of early pregnancy:*

Cessation of menses.

Morning sickness.

Enlargement of uterus.

Congestion of vulva and vagina.

Mammary changes, etc.

2. *Premonitory Symptoms.*—These may or may not be present:

Irregular hemorrhages.

Casting off of decidual shreds or masses.

Severe pain in either iliac fossa.

After the fourth month (should rupture not yet have occurred) there may be:

Interference with micturition and defecation due to the abnormally placed tumor pressing upon bladder and rectum.

3. *Symptoms of Rupture of Sac.*—These may appear suddenly, and without any premonitory symptoms; they are those of hæmatocele—the symptoms of abdominal shock and loss of blood:

Syncope.

Severe pelvic pain.

Pallor.

Dimness of vision.

Rapid and feeble heart action.

Shallow, sighing respiration.

Nausea and vomiting.

Singultus.

Clear intellect.

Surface cold and covered with clammy perspiration.

This condition terminates either in collapse and immediate death, or the woman rallies only to be attacked by peritonitis or by septicæmia, usually ending fatally, but not necessarily so.

In abdominal, tuboövarian, and ovarian pregnancies, since the cases usually go on to full term, the symptoms of pregnancy take place at this time: the sac is occasionally ruptured, and shock, followed by death, or peritonitis or septicæmia, results. But usually

this does not take place; the fœtus undergoes the various changes already mentioned.

The danger of peritonitis and septicæmia always exists as long as the altered mass is retained in the abdominal cavity; these are especially liable to occur whilst the putrefied and liquefied mass is being extruded through fistulous openings.

The *causes of death* in all forms may be:

Shock.

Hemorrhage.

Peritonitis.

Septicæmia.

Perforation of viscera.

Exhaustion following prolonged process of extrusion.

Physical Signs.—There are the mammary evidences of pregnancy. The vulva is congested and the uterus is found enlarged, elevated, and displaced to one side or forward; when we investigate the cause of this displacement, we find a tumor usually to one side or somewhat behind the uterus; this tumor is not very sensitive, almost immovable, grows rapidly, and sometimes ballottement can be made out. By rectal examination we may learn considerable. The use of the sound, unless the certainty of the pregnancy being extrauterine exists, or excepting as a last resort, is contraindicated.

Differential Diagnosis.—It is most likely to be confounded with:

Normal pregnancy.

Retroflexed gravid uterus.

Impregnation of one side of a double or bicorned uterus.

Cyst of ovary or broad ligament.

Uterine fibroma or cysto-fibroma.
Hæmatocele.
Periuterine inflammation.
Pelvic abscess.

In the first three conditions we can sometimes feel the uterus to be separate from the tumor, and the latter does not contract as does the impregnated uterus; should we have exhausted all methods of examination without definite conclusions, it would be justifiable to use the sound and to dilate the cervix, even at the cost of terminating a natural pregnancy, should one exist, since the diagnosis is so urgently required.

The other conditions in the above list are not accompanied by the mammary and other symptoms of pregnancy, and give a different history. In certain cases, puncture and examination of the obtained fluid (if any) will aid the diagnosis, and may at the same time be curative, as will be presently explained.

The differential diagnosis is in many cases difficult; when impossible, it is generally better to assume extra-uterine pregnancy, and to treat accordingly.

Differentiation of the Varieties.—This is in most cases difficult, and in many cases impossible.

Thomas says: "In general terms it may be said that the interstitial form is very rare, that the tumor consists of an irregular enlargement of the uterine body, and that the tumor moves with the uterus, while at the same time this organ is empty; that tubal pregnancy gives an enlargement at the side of the uterus, yields ballottement more generally than the other forms, and is marked by a tumor somewhat separated from the uterus, and which does not decidedly move with it; and that abdominal pregnancy is generally detected late, at a period when the rolling of the child's

body in the abdomen can be detected, while at the same time the uterus is found to be empty."

Prognosis.—Whilst formerly the prognosis was considered bad in all forms, it is now regarded as favorable since the diagnosis is often made early, and then, electricity to produce the death of fœtus produces very good results; thus in 75 cases lately reported there were only 4 deaths; this applies to the tubal variety. The prognosis is less favorable in the abdominal form, but even here, laparotomy has diminished the mortality very much; even without such operative interference the case may recover—the fœtus may die and extensive adhesions take place between the tumor and surrounding parts.

Thomas gives the mortality of cases of extrauterine pregnancy in general as $33\frac{1}{3}$ per cent.

Treatment.—This may be summarized as follows:

1. To destroy life of fœtus.
   a. Tapping and drawing off liquor amnii.
   b. Injecting morphine.
   c. Electricity.
2. To remove fœtus.
   a. Incision through wall of vagina.
   b. Incision through abdominal wall.

In all cases excepting abdominal, interference is called for as soon as the diagnosis is established.

In the abdominal variety, where the child is living, laparotomy should be performed at term; if child is dead, the operation should be delayed, so as to allow atrophy of placenta and of fœtus, or where suppuration results, to permit Nature to indicate where exit is to take place.

Tapping the Sac and drawing off Liquor Amnii.—A small needle should be employed, and strict anti-

sepsis used. This method, though sometimes successful, often causes the death of the patient, and, hence, is inferior to the following ones.

Injection of Morphine into the Sac.—This is done through the abdominal or the vaginal wall, with a long, slender hypodermic needle antiseptically cleansed; ten or fifteen minims of Magendie's solution are used. This method is a good one, but is not absolutely certain in its effects.

Electricity.—This is decidedly the preferable method of causing the death of the fœtus and checking the advance of pregnancy; it is applicable to the tubal form; since this variety is the most frequent, the importance of this plan of treatment cannot be overestimated. Brothers (*American Journal of Obstetrics and Diseases of Women and Children*, Feb. 1890) has collected statistics of 75 cases treated by electricity, in which only 4 deaths occurred; all the other cases were cured.

Electricity should not be resorted to after the fœtus has advanced to the fourth month.

Either a strong faradic current, or a galvanic current of twelve cells, interrupted from time to time, may be used. Each sitting should not be over five minutes, or less if any symptoms of depression show themselves; it should be repeated several times. One electrode is applied in the rectum or vagina, and the other over the prominent part of the tumor on the abdominal surface.

This procedure simply destroys the life of the fœtus; the latter then undergoes mummification or maceration, or is converted into a lithopædion, and may remain for an indefinite period, or be extruded by fistulous openings in various directions.

Should signs of septicæmia be developed, we should interfere and extract the fœtus and wash out the sac; the opening for extraction is made either through vagina or by laparotomy, with knife or cautery.

Extraction by Laparotomy.—In the abdominal form of pregnancy, we allow the case to progress to term, and then extract the child, if we believe it to be alive; if dead, we wait some time, but operate by laparotomy as soon as there is any danger from septicæmia to the mother. The most favorable cases for laparotomy are those in which the fœtus and its membranes have become isolated from the rest of the abdominal contents, by adhesion to the anterior abdominal wall, so that when we open the latter, we can extract the fœtus and wash out the sac, without disturbing the peritoneal cavity. If such adhesions do not exist, we must stitch the edges of the sac to the opening in the abdominal wall, and thus separate it from the abdominal cavity. In all cases in which we remove the fœtus, we leave the placenta to come away by itself, as it does in a few days.

Extraction by Vagina.—A fœtus may, in certain favorable cases, when low down in the pelvis, be extracted at term, by an opening in the vaginal wall; the sac being then washed out gradually contracts, when the opening in the vagina is allowed to heal.

If the pregnancy be interstitial, the fœtus should be destroyed by electricity; we should try to extract it some time afterward, through an incision into the uterine wall at the seat of the distention, or we may extract it by incision through the vaginal or abdominal wall, or, in some cases, leave it alone.

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